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ABSTRACT

The information contained within this guide about flora of the ferns and fern allies of the Catskill Mountains of New York State covers medical and food uses of the plants, as well as the more typical floristic data of keys, drawings, and plant descriptions. (CS)

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**A CATSKILL FLORA
AND
ECONOMIC BOTANY**

I. PTERIDOPHYTA

The Ferns and Fern Allies

KARL L. BROOKS

Bulletin No. 438

New York State Museum

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12230

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EDITOR'S PREFACE

This is the work of an amateur botanist whose many years of collection and study of Catskill plants make him the person most qualified to produce such a treatment in the tradition of the old herbals. We at the Botany Office of the New York State Museum feel that this type of publication is a useful adjunct to our efforts to produce a comprehensive state flora. The author's intimate knowledge of the area and its plants makes this a valuable work for those who are native to the Catskills, as well as for the many summer visitors. Medical and food uses of plants, though often only of historical interest, round out the treatment, and make this publication what it is intended to be--a source book for those interested in reading and learning about the Catskill flora. Indeed, since the vast majority of the plants discussed are widely distributed throughout the northeastern states and adjacent Canada, this work should also be of interest far beyond the narrow confines of the Catskill region.

IMPORTANT NOTE

All economic uses, folklore, medical and pharmaceutical notes, uses as foodstuffs, etc., are compiled from the literature and do not represent an endorsement by the author or the New York State Museum. Some of the uses may, indeed, be dangerous if incorrectly employed. Some are not effective and are presented for historical interest only.

PREFACE

The Catskills have long been known for their unusual beauty, healthful climate, and their natural resources for recreation, not the least of which is their abundant wildlife and in some respects a unique flora. While it is true that a large percentage of the plants growing naturally in the Catskills also occur throughout most of the northeastern states and adjacent Canada, many species are rare, only locally abundant, or do not occur elsewhere in the eastern states. Some are northern elements found only on the high peaks, and others appear to have been stranded in isolated areas following the retreat of the last glacier some 10,000 years ago. But whether rare in distribution or more abundantly widespread, no plant is completely devoid of interest, and many have had a long and varied association with man that goes back over many millennia.

A study of the flora of any region can be a richly rewarding experience, and that of the Catskills is no exception. Simply getting to know what plants grow in a particular area brings one closer to an understanding of the wonders of nature, but it has long been my contention that just knowing a plant by name is only the beginning. What is its relationship to other plants, both wild and cultivated? Of what value is it to man and to wildlife? Is it edible, a source of dye, useful as a medicine, or is it just an obnoxious weed? How can it be prepared for the table? For what was it prescribed? How can one get rid of it? Answers to such questions not only lead us down many intriguing paths, but also contribute much to our understanding of the intricacies of the biosphere.

My work on the Catskill flora during the last quarter of a century has therefore a three-fold objective: (1) to determine precisely what species grow in this area, (2) to chart the known distribution of each species in the Catskills, and, (3) for each, to collect as much information as possible concerning its value to man and to wildlife. These objectives have led to many hours of work in the field collecting specimens and making observations of the plants seen, plus countless others in libraries and herbaria to obtain information on their distribution and use.

This work was written primarily for the serious amateur with a desire to know more about the plants growing in the northeastern states and adjacent Canada, with particular emphasis upon those occurring in the Catskills. In these times of increasing concern for man's impact upon the environment, the dwindling food supply in relation to increased population pressure throughout the world, inflation, and the rising desire of a large segment of the people to return to fundamentals, as it were, it is hoped that the emphasis given to economic botany, and to the importance of our native flora to wildlife, will fill a basic need. So far as the writer is aware, this is the first time that detailed information on food, drug, and dye plants has been assembled in a compilation that includes the common weeds as well as the more obscure components of our flora such as the grasses and sedges, which most popular field guides ignore completely.

In addition, "plant biographies" summarizing basic data concerning the name, type of plant, range, distribution, origin, and time of flowering (or fruiting) are provided for each plant occurring in the Catskills, together with some remarks on other salient facts of the plants in question. Detailed distribution maps showing by township the localities where each species has been observed are supported by data culled from the literature and an examination of herbarium specimens, in addition to many thousands of observations in the field. The citation of observations is a comparatively recent innovation in helping to determine the distribution of the many species making up our flora; in addition, so far as the writer is aware, never before have photographs been cited as evidence for the occurrence of a particular species in any given area, thus placing them almost on a par with herbarium specimens. In view of the number of rare and endangered species now stringently protected by law, this practice is likely to attain increased importance. These data, together with the keys, illustrations, and detailed notes on each of the various species, should help the serious student not only to identify the plants in question, but to provide the basic knowledge that will enable him to view the plant world as a vital part of the planet on which he lives.

In collecting and organizing this information, the writer has attempted to proceed from the general to the more specific, starting with the orders into which the various plant families are organized, then presenting some ideas on their evolution and possible relationships to each other, together with comments on both wild and cultivated plants, in the hope that such an overview will provide a more meaningful picture of each group of plants. The families making up each order of the Catskill flora are then presented (in "manual" order), with an attempt to relate any cultivated plants in that family to their wild cousins before going on to a discussion of the wild species themselves. Where possible, information on their economic value to man and to wildlife has been supplied. With few exceptions, genera are arranged alphabetically under families, and species are arranged alphabetically under genera. To aid in the identification of the various species, keys to genera and species are included, and illustrations of the various species have been chosen with considerable care.

Some may object that such an accumulation of material is not truly a flora, but that is a matter of definition. In any case, such a study is not only its own reward, but a knowledge of the world of plants and their relationships to wildlife and to man, not to mention an enjoyment of the natural world as opposed to the artificial concrete jungles of our modern cities, brings a perspective not to be attained in any other way. This may perhaps seem to be getting far afield, but all the world is an intricately balanced biosphere, and man must not only understand its complexities, but must also be able to accommodate himself to its demands if he, himself, is to survive as a species.

A work of this nature could not have been completed without the help and encouragement of a number of people. My wife, Marguerite, has borne the brunt of my numerous idiosyncrasies, both as a constant companion in the field and as a demanding editor and critic. The late Stanley J. Smith, curator of botany at the New York State Museum, not only spent countless hours checking my specimens and graciously permitted access to the state's

records on plant distribution, but has also been mentor and companion in the field on many occasions, to say nothing of his continuing advice and encouragement for over a quarter of a century. In addition to supplying moral support and companionship in the field, Paul Huth, who fell heir to the Domville-Dunbar records of the Ulster County flora, was kind enough to check through several thousand cards to extract information pertaining to collections and observations made in the Catskill region of that county.

More than thanks are due to Elizabeth G. Hall, formerly librarian at The New York Botanical Garden, whose vast knowledge of botanical source material seems inexhaustible and whose boundless enthusiasm is infectious. She has been unfailing in digging out elusive books and suggesting sources of information in addition to supplying many details concerning earlier workers in the field. Librarians at both the Horticultural Society of New York and at The New York Botanical Garden have also been most helpful. Last, but in no way least, thanks are due to Patricia Holmgren, herbarium supervisor and administrator of the phanerogamic herbarium at The New York Botanical Garden, and to George Kalmbacher, curator at the Brooklyn Botanic Garden, for permission to check specimens in the herbaria at those institutions.

The writer is likewise much indebted to the following authors and publishers for permission to reproduce illustrations, each of which is identified as to source in the caption: Physiography of the Eastern United States by Nevin M. Fenneman, copyright 1938 by McGraw-Hill Book Company, New York; The Fern Guide by Edgar T. Wherry, published in 1961 by Doubleday & Co., Inc., New York; Ferns of the Eastern Central States, copyright by Jessie M. Shaver, reissued in 1970 by Dover Publications, Inc., New York; and to Ferns of Michigan by Cecil Billington, Bulletin No. 32, copyright 1952 by the Cranbrook Institute of Science, Bloomfield Hills, Mich.

Karl L. Brooks

Brooklyn, New York
30 March 1979

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INTRODUCTION

The Catskills. To anyone trying to determine the area occupied by the Catskills with some degree of precision, Alf Evers' (1972) statement that "It is not easy to describe the boundaries of the Catskill Mountains" seems something of an understatement. One might think that the boundaries of the Catskill Forest Preserve should mark the extent of the Catskills. By reason of political and economic considerations, however, the Catskill Forest Preserve in fact not only occupies only the eastern half of the Catskills, but in Ulster County also includes parts of the townships of Woodstock, Hurley, Ulster, and Olive that actually lie outside the Catskill region proper. Evers (*ibid.*) is more nearly correct in describing the extent of the Catskills as defined by "common consent." "Only to the east and northeast do the Catskills have simple natural boundaries," he states, where the escarpment rises abruptly between two and three thousand feet above the Hudson valley, and where in "only two places have road-makers breached the wall and sent highways winding up the precipitous gorges known as the Kaaterskill and Plattekill coves," but he is not quite correct in saying that "On their other sides the Catskills have no obvious boundaries."

"Common consent," he continues, "accepts the country around Stamford in Delaware County as forming the Catskills' northwest corner." From that point the common-consent line runs southwest down the west branch of the Delaware river into "lake-studded Sullivan County." "Somewhere in Sullivan County--there is debate about just where--the common-consent line heads eastward until it reaches the foot of the Shawangunk Mountains," from which it heads northeast "to the beginning of the eastern wall at Woodstock's Overlook Mountain."

Neither this "common-consent line" nor the boundaries of the Catskill Forest Preserve correspond very closely with the ideas set forth by geologists and physiographers, particularly on the northern side. On the other hand, at least initially, both the Temporary State Commission to Study the Catskills and the Catskill Center for Conservation and Development went to the opposite extreme by including in the Catskill region all of Delaware, Greene, Ulster, and Sullivan counties as well as all of Otsego and Schoharie counties and half of Albany County. This was no doubt an excellent idea from the standpoint of developing a comprehensive overview for conservation and preservation of the natural resources of that area, but it presents a distorted view of the actual extent of the physiographic boundaries of the Catskills.

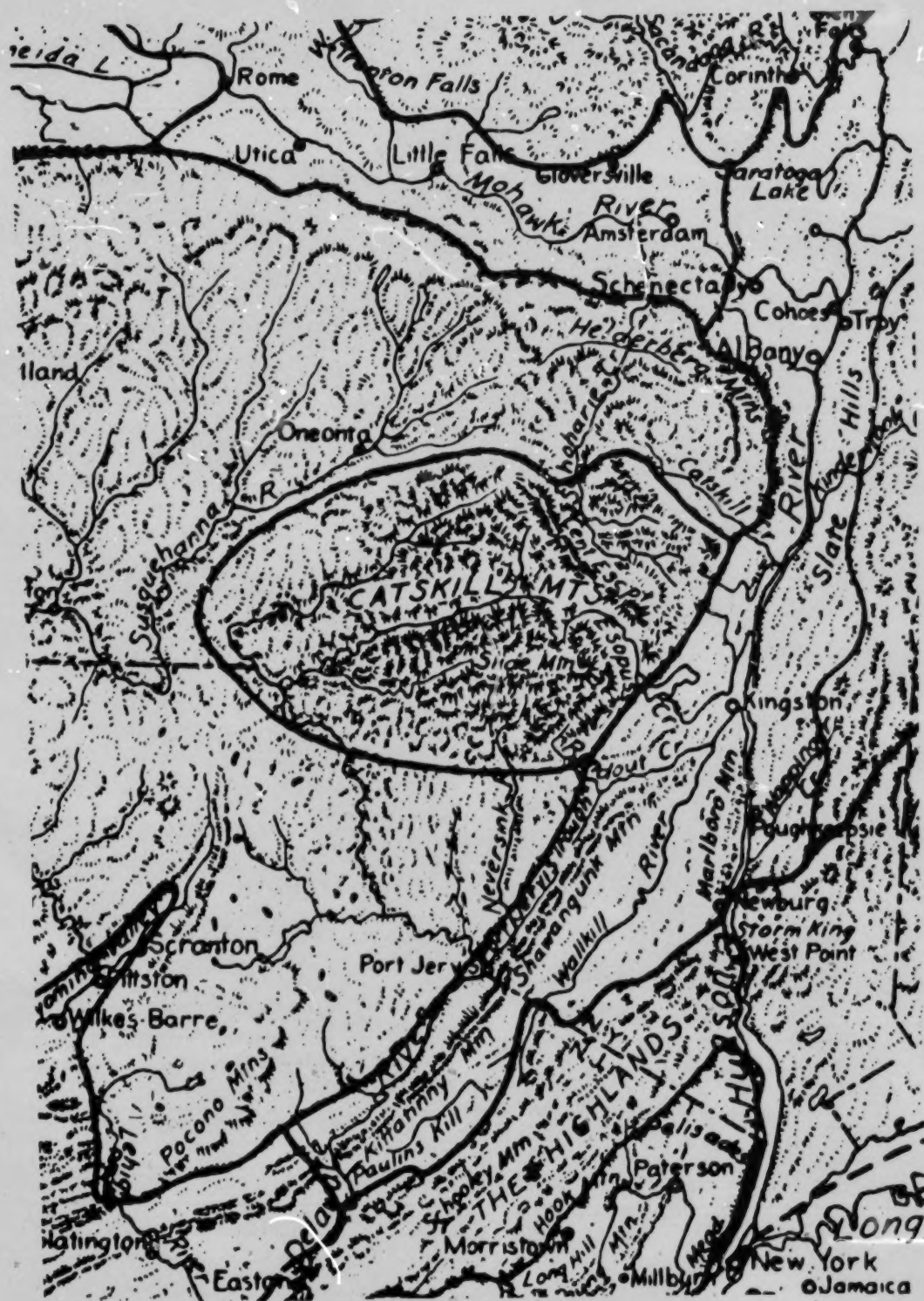
J. Russell Smith, professor of economic geography at Columbia University, dedicated his book North America (1925) to three people, one of whom was Nevin M. Fenneman, "whose labor in delineating the physiographic provinces of the United States is a contribution which has placed all geographers in his debt." It is therefore to Fenneman (1938) that we turn to refine our ideas as to the area actually occupied by the Catskills as a physiographic unit. His map of the northeastern United States, reproduced in part on page 3, shows the Catskill mountains to be surrounded by the glaciated Allegheny plateau except on the eastern side, where they border

the Hudson river valley. While the Catskills rise considerably higher than the neighboring parts of the glaciated Allegheny plateau and hence constitute a distinct unit, they are nevertheless structurally a part of it.

From Fenneman's map it is at once evident that the west branch of the Delaware river does not form the northwestern boundary of the Catskills. That boundary, at least from near Butts Corners to Oneonta, roughly follows Route 23 to the Susquehanna river valley at Oneonta, below which the Catskill escarpment is quite marked to the south near Wells Bridge, Unadilla, and Sidney. From south of Hancock, the southern boundary swings almost due east across Sullivan County somewhat south of Liberty and across Ulster County to the Hudson valley north of the Shawangunks. On the northern edge east of Stamford, the boundary juts north-eastward into Schoharie County, covering parts of the townships of Jefferson, Gilboa, and Conesville and a corner of the Town of Rensselaerville in Albany County before swinging southeast through Greene County. As a matter of fact, Fenneman himself appears to have been somewhat uncertain about the location of some of the boundaries of the Catskills, for his map of that region in the text does not correspond in all details, particularly on the southern edge, with his final decision as expressed on the map in the pocket of the back cover. In the text his map places the southern boundary of the Catskills farther north, in a position closely approximating the southern boundary of the Catskill Forest Preserve, in Sullivan County almost completely eliminating the townships of Fremont, Callicoon, Liberty, Fallsburg, Warwarsing, and part of Neversink. This writer is of the opinion that in Sullivan County the townships of Rockland and Neversink unquestionably lie within the Catskill region, while the inclusion of those to the south is open to some doubt. Since both the northern and southwestern limits of the Catskills are anything but sharply defined, however, it seems best to accept Fenneman's final decision.

The rocks that make up the Catskill mountains consist of a nearly horizontal plate which has eroded but slowly and still continues to protect the beds below, although in some areas it has been deeply carved. This protecting rock is a coarse, porous sandstone except for the highest peaks, which are capped by a conglomerate (very evident, for example, as one approaches the summit of Slide Mountain). On the southeast the Catskill escarpment descends to the Hudson valley with a drop, in places, of 3000 feet; in the northeast and north, it descends to a broad and deeply cut bench some 2000 feet high, the local representative of the glaciated Allegheny plateau. The whole area is maturely dissected into mountains of diverse height, a striking characteristic of the topography being its rough terrain. A few summits are around 4000 feet high but most of them are between 3000 and 4000 feet, some of which rise 2000 feet above the nearby valley floors. Valleys are relatively few and the intervening masses are correspondingly bulky.

Rich (1936) clearly describes the early geological formation of the Catskills: "At the time the sediments that now form the rocks of the Catskills were being deposited during the Late Devonian age, high mountains existed in what is now New England and southeastern New York,



The Catskills are surrounded on the north, west, and south by the glaciated Allegheny plateau; on the east they border the Hudson river valley [adapted by permission from Physiography of the Eastern United States by Nevin M. Fenneman, copyright 1938 by McGraw-Hill Book Company, New York].

and a shallow sea covered western New York and Pennsylvania and extended into the Mississippi valley. Between those ancient mountains and the open sea, in the region now occupied by the Catskills was a great and slowly sinking delta or alluvial fan upon which the rivers from the mountains to the east were spreading gravel, sand and mud, much as the rivers from the Sierra Nevada mountains are doing in the Valley of California today. These alluvial materials, which accumulated to a thickness of several thousand feet as the land subsided, were relatively coarse on the eastern side nearer the mountains, but became finer, grading into sand and mud in a westerly or seaward direction. Deposition on the delta gradually slowed and eventually ceased as the mountains were worn low. Finally, in the course of ages, the ancient Catskill delta was uplifted and now stands higher than the mountainous region of New England whence its constituents were derived."

The rocks of the eastern Catskills, having been deposited on the landward side of the ancient delta, contain considerable amounts of coarse cemented gravel or conglomerate, especially in the upper beds. These rocks not only contain erosion-resistant material such as quartz pebbles, but they are rather porous. Much of the rain falling upon them therefore sinks into the ground, thus retarding stream erosion. West of the higher peaks the conglomerate grades into sandstone and the proportions of shale become larger. Such rocks have less resistance to erosion and the mountains have consequently become more worn, resulting in a lower elevation, in many places nearly grading into the glaciated Allegheny plateau on the north, west, and south.

Glaciation. The outstanding event of the Pleistocene epoch was the glaciation of the northern hemisphere. While, in the words of Clark and Stearn (1960), "We cannot yet say with certainty when the Pleistocene epoch began, ... the evidence of the deep-sea cores suggests that the event was closer to 500,000 years ago than to 1,000,000 years, the figure accepted by geologists until recently." Four major advances of the continental ice sheet occurred during this time, with three interglacial periods during which most of the continent was free of ice. The last of these advances is known in North America as the Wisconsin drift, of which at least four substages have been recognized. The Wisconsin glaciation took place within the last 30,000 years, with the ice retreating from the Great Lakes region as recently as 8000 B.C. The Catskill mountains were entirely covered by the early Wisconsin ice sheet and again partly covered during its last advance. One noteworthy result of this glaciation was the formation of the scenic "notches," which were cut deeper by water from the retreating ice front.

When the Wisconsin ice sheet first advanced over the Catskills, the region was undoubtedly covered with soil derived from the weathering of the sandstone and shale rocks of which the mountains are composed. The moving ice scraped off the loose soil, plucked from the sandstone ledges blocks of all sizes, and carried the whole forward in, on, and under the ice. When the ice melted, this material was either deposited at the place of melting or was carried away by streams issuing from the melting ice. Some of it was piled up as moraines at the ice border, some was carried away as outwash by streams issuing from the melting ice, and

some was spread out as a sheet of ground moraine or till. This till, which covers much of the Catskill region, is an unassorted mixture of clay, sand, and stones, plus boulders of all shapes and sizes. As a rule the Catskill till is very stony, and much of the area is therefore unsuited for cultivation.

Owing to the presence of large volumes of water around the edges of the glaciers, there was abundant opportunity for water-sorting of the glacial debris, resulting in a variety of types of stratified drift ranging in texture from the coarsest outwash gravels to the finest lake clays. Along the east branch of the Delaware river from Roxbury to several miles below Margaretville, for example, terrace remnants of outwash gravel are conspicuous. These gravel banks are locally important as a source of road-building and construction material. Lake clays have also been deposited in a number of areas, but most such deposits are concealed by a veneer of till of variable thickness so that little or no economic use has been made of them in the Catskills.

Rich (1935) sums up the economic effects of glaciation in the Catskills as follows: "The glaciers greatly affected the economic possibilities of the Catskill region in many ways. They completely reworked the soils; made workable deposits of sand, gravel and clay in many places; and interfered with the normal stream drainage, causing lakes, swamps and waterfalls.... One of the most important detrimental effects of the glaciers was to scatter stones of all shapes and sizes through the soil.... Clearing away these stones so that the land could be cultivated was one of the hardest tasks of the early settlers and one that is not yet completed, for the frost continually brings new crops of stones to the surface. The stone walls so abundant in many parts of the Catskills testify to the task that has been imposed on the settlers by the glacially transported stones. ... The till, which is the thin glacial soil covering most of the mountainsides, is generally used for pasture or woodland. As a rule it is too thin or too stony or on land too steep for profitable cultivation."

Sand, gravel, and clay are therefore moderately abundant in the Catskills, but some deposits are much better in quality than others. Numerous lakes were likewise formed by the glaciers and these are becoming increasingly important for recreational purposes. In addition, by diverting streams from their normal courses, a number of waterfalls and rapids were created; these are better known for their scenic beauty than as sites for waterpower.

There are no outcroppings of limestone in the Catskills, yet one surprising feature of the flora of that region lies in the fact that it contains a number of species that demand lime or at least some trace of it. These plants occur sporadically throughout the area and include, among others:

Asplenium rhizophyllum
Athyrium pycnocarpon
Cryptogramma stelleri
Cystopteris bulbifera
Dryopteris goldiana

Arabis laevigata
Hackelia deflexa var. *americana*
Viola striata
Milium effusum
Oryzopsis racemosa

Carex albursina
C. sprengelii

Uvularia grandiflora

The explanation of the occurrence of most of these species lies in the fact that some of the Catskill sandstones and shales must contain at least enough lime to sustain them. The Kortright station of the Walking Fern is of note in that the plants completely cover two isolated boulders, with no evidence of their occurring elsewhere in the immediate area. One can conclude only that these boulders were deposited glacially, having been transported by the ice from a much more remote area.

Organization and Scope. The plant world is complex, presenting to the novice such a bewildering array of diverse forms that to gain some knowledge of them seems at first almost a herculean task. But few people reach an adult state without some knowledge of the outdoor world, including the ability to distinguish a dandelion from a daffodil, and somewhere along the line comes at least a hazy realization that some plants are rather similar and closely related to others--that Caraway much resembles a Carrot, that there are several different kinds of violets and asters, and that radishes and turnips have a number of points in common. Therein lies the concept for grouping the various genera into "families," and combining closely related families into "orders."

Knowledge of these groups constitutes the basis for a comprehensive overview of the plant world. Considerable effort has therefore been made in the present work to explain these relationships so that an amateur can get his bearings and pilot his way through the intricate maze of the botanical world, starting with the six large groups into which scientists have traditionally organized the vascular plants:

- Pteridophyta--The ferns and "fern allies," reproducing by spores
- Coniferae--Mostly evergreen, usually cone-bearing trees and shrubs
- Apetalae--Catkin-bearing plants and those having simple flowers without petals
- Polypetalae--Plants with flowers bearing numerous petals (but not to be confused with the ray flowers of the composites)
- Sympetalae--Plants with the petals more or less united, often forming a "trumpet," as with the Morning-glory
- Monocotyledonae--Plants with a single cotyledon instead of two, including the grasses, sedges, lilies, orchids, and others

Each of these six large groups of plants is further divided into orders, made up of groups of closely related families, which in turn are composed of closely related genera. A genus is made up of closely related species. There are, for example, several different kinds of maples; these are all placed in the same genus--Acer. Throughout this work, an effort has been made to point up the characteristics of each order, showing its relationship to other orders within the larger group. In discussions of both the families and the genera making up these families, emphasis has been placed upon both cultivated and wild plants making up these taxa, not only to point up the relationships involved but to present a broad view of the group, with emphasis on the economic importance of these plants. Notes on economic botany include information on dye plants, ornamentals, weeds, and the value of various species to wildlife.

Within each family are included all species for which definite records of occurrence in the Catskills could be documented. Such records were established from printed sources, specimens in various herbaria, field collections, and personal observation throughout the Catskill region. This is not to say that such records are by any means complete. Continued field work constantly turns up species previously unrecorded, but a special attempt has been made to include all known records of the species, subspecies, and important varieties known to grow in each township comprising the Catskill region. For each species, these data are shown on the distribution maps and their accompanying records in the Appendix.

There is sometimes a problem in deciding whether to include a plant which has "escaped from cultivation." With respect to annuals, the situation is rather clear-cut. If any garden plant produces seed that germinates at a later season and by itself produces a plant that bears flowers without having been planted or tended in any way, it can be considered a legitimate addition to the flora of that region, even though it may not persist or become definitely established. Perennials, on the other hand, represent a quite different problem, as they frequently spread by means of creeping rootstocks or, in the case of a number of trees, by means of sucker shoots. Bugle (Ajuga reptans), for example, frequently invades the lawn adjacent to the flower bed where it has been planted, and one is tempted to include it in the flora as "spread from cultivation," which in a sense is true. But the plants in the lawn are still attached to, and actually a part of, the original cultivated plant; it should therefore not be added to the flora on that basis alone. If, on the other hand, it is dug up and thrown on the dump or refuse heap, where it takes root and spreads by itself, it can be considered a legitimate addition to the flora. There is no problem, of course, where it can be demonstrated or assumed with some degree of certainty that any plant, annual or perennial, has seeded itself. The writer has in all cases been quite conservative in deciding which plants could legitimately be included in the present flora as "escaped from cultivation" and has refrained from adding any species which, from its setting or his knowledge of the circumstances involved, did not appear to have reproduced itself without benefit of cultivation.

Throughout this work detailed notes on how to prepare edible plants for the table have been included. It must be pointed out, however, that there are poisonous plants in the Catskills. Before preparing any plant for the table it is vital to know without question what plant is at hand. Two plants, for example, are locally known in the Catskills as "Skunk Cabbage." The true Skunk Cabbage (Symplocarpus foetidus) is edible; the other one, which might better be called Bearweed or False Hellebore (Vera-trum viride), is deadly poisonous. It should hardly be necessary to mention that preparing a dish of boiled greens from Bearweed would be disastrous and that one should refrain from culinary experiments until such time as he is absolutely certain that he knows what he is doing--not only in this particular instance but in others as well. The indiscriminate collecting of mushrooms (not treated in this work) can be equally deadly. The numerous illustrations and keys provided throughout this flora should enable the novice to identify the various plants under discussion.

Included also are notes concerning the various medicinal uses made of certain species, both in the past and at the present time. In spite

of the abundance of synthetically prepared drugs on the current market, Krochmal (1968) remarks that in 1962 it was estimated that more than 34 percent of all prescriptions contained a drug from natural plant sources. Krochmal and Krochmal (1973) state that in the United States alone it is believed that more than \$500 million are spent annually for botanical drugs. More than 65 species of plants growing in the Catskills are still in demand by manufacturers of pharmaceutical products. While much information on drug plants is included herein, it is by no means the intention of the writer to suggest the treatment of any physical disorder. Not only is that the proper province of a physician, but experimentation with drug plants could lead to disaster, as many of them are poisonous in the wild unprocessed state. Much of the information on the folk uses of medicinal plants has not only yet to be proved by modern scientific research, but experiment with some of the plants could easily result in death. Only a physician is qualified to treat physical disorders.

Illustrations and Keys. The identification of an unknown plant presents a definite problem not only to the amateur but sometimes even to the professional botanist. The best way to learn the names of the plants, of course, is to go out with someone who can identify them for you. Even though you may be confronted with a large number of confusing plants on such a field trip, by collecting specimens and taking notes, in a surprisingly short time you will find that your acquaintance with the plant world has broadened markedly. But it is not always possible to have a botanist with you when you come across a strange plant. Good pictures are of great value in helping the amateur to identify an unfamiliar plant; considerable effort has therefore been made in this work to provide illustrations that not only show what each species looks like but, in so far as possible, also to portray diagnostic differences between closely related plants.

The professional botanist, however, relies heavily upon word descriptions pointing out the specific features that help to distinguish one plant from others that may be closely related. This information is presented in keys in such a way that by reading each of two opposed characteristics and deciding which one applies to the plant in question, one is led eventually to the name of the plant at hand. As an example, turn to the "Key to Local Species of Lycopodium" on page 40. First, it is assumed that the specimen at hand is a clubmoss, as can be ascertained from the "Key to Families of Local Pteridophytes" on page 25. If your species is not a spore-producing plant, its identity must of course be sought elsewhere.

The first of our choices (both marked with the numeral "1") reads "Sporangia [spore-cases] borne in the axils of ordinary leaves, not forming a well-marked terminal spike ..." as opposed to "Sporangia borne in the axils of the upper leaves, which are modified and bractlike, the whole forming a dense terminal spike ..." Assuming that the sporangia of your plant are borne in a dense terminal spike, read the next pair of choices (marked "3") to determine whether the sporophylls [leaves bearing the spore-cases] are "green and leaflike, ... similar to the foliage leaves" or if they are "yellowish, scalelike, their bracts very different from the leaves of the sterile parts of the stem ..." If the sporophylls are yellowish and scalelike, with bracts very different from the rest of the leaves on the stem, one must proceed to the next set of choices ("4"),

and so on until you have located the set of characteristics that describes your plant. One's specimen should, of course, bear sporophylls of the current season. If they have been collected too early in the season, however, the condition of last year's sporophylls should be noted.

Here one might suggest that it is usually easier to key out freshly collected material than to work with dried herbarium specimens, where some of the key characteristics may have become obscured during the pressing and drying operations. Sometimes one is not sure which of the two choices apply to the plant at hand. If, for example, you are not sure whether the sterile branches of your plant are convex and uniformly leafy on all sides or if they are flattened or concave beneath, run through both sections of the key to see what species you come up with, then consult the illustrations in this work or the descriptions given in Fernald (1952), Gleason (1952), or one of the field guides; these should help you to determine, by the process of elimination, which plant you have collected.

Keys to genera and species have been provided from information contained primarily in Fernald (1950), Gleason (1952), Wiegand and Eames (1926), McVaugh (1958), Muenscher (1950), Steyermark (1963), Bailey (1949), and Peterson and McKenny (1968). Information on the Catskill flora from these sources has been rearranged, combined, and simplified in an effort to make them easier to use and to bring out diagnostic features found throughout much of the growing season; it is rather disconcerting to find a key to flowers only, which may be available only for a short time in the spring, when one has collected a specimen much later in the season. In using these keys, however, it must be kept in mind that they include only those species known to occur in the Catskills at the time the keys were compiled. Continued exploration of the area is certain to turn up plants that have not been included, in which case recourse must be had to the keys contained in Fernald (1950), Gleason (1952), or in Bailey (1949) in order to identify such additions to the flora.

Plant Biographies. In a work of this nature it is not only undesirable but impossible to avoid use of the scientific names of plants, in spite of the fact that most amateurs are unfamiliar with them. Each "plant biography" therefore starts with the scientific name of the plant under discussion, together with its author. An attempt has been made to follow the nomenclature used by the botany office of the New York State Museum in Albany. Where that name differs from that (or those) given in Fernald (1950) or Gleason (1952)--the two current manuals of botany for the northeastern states and adjacent Canada--the manual name is listed under "Synonyms" so there will be no doubt as to the identity of the plant in question. (Other pertinent synonyms are also occasionally given.) The scientific names are marked with long (') and short (˘) vowel accents as an aid to pronunciation.

For the amateur unfamiliar with scientific names, a vernacular or common name is also listed. Some plants have never been conspicuous enough, common enough, or important enough, however, ever to have received a common name. In most such cases, the writer has not hesitated to manufacture one, a practice deplored by some botanists, but justified, perhaps, by providing the amateur with a convenient label. In other cases there is an embarrassing number of vernacular names to choose from

and the problem has been to select the one most widely used. Another disconcerting fact is that the same common name is frequently used by different people for different plants. A "Mayflower," for example, to one person is a Spring Beauty, while to another it may refer to Trailing Arbutus, and a third may be talking about Hepatica. Since there is no standard for the use of common names, the writer has tried in each case to select the name most commonly used or to select an appropriate one, sometimes, perhaps, flying in the face of tradition where a much-used common name seemed inappropriate.

Since few people are familiar with Latin, "Meaning of Species Name" gives a "translation" of that part of the scientific name (the derivation and meaning of the genus name appears earlier in the discussion of the genus as a whole). In addition, other commonly used vernacular names are listed under "Other Names." "Type of Plant" identifies the species as a tree or shrub, an annual, biennial, or perennial herb, an aquatic, parasite, or saprophyte, while the "Range" gives the geographical distribution of the species in North America. The notes on "Distr[ibution] in N[ew] Y[ork] S[tate]" were taken from House (1924), while those on "Distr[ibution] in the Torrey Range" came from Taylor (1915), in both cases reflecting distribution records as they were known at the time. The Torrey range was established by the committee on local flora of the Torrey Botanical Club in 1888 to include the area roughly 100 miles from New York City; in New York State, Delaware, Greene, and Columbia counties, together with the area south of them, were included in the Torrey range, plus the northeastern counties of Pennsylvania, all of New Jersey, and all of Connecticut.

Under "Elevation" is listed such information as was noted in the various references consulted plus information sometimes noted on herbarium specimens. "Time of Fl[owering]" is self-explanatory, except that mention might be made of the fact that, when available, more precise data for the latitude of the Catskills were taken from Wiegand and Eames (1926), as given for Cornell. Where of particular interest, time of fruiting is also given. Under "Origin" is found such information as to whether the species is native, introduced from Europe, adventive from the west, and the like. When only a comment or two was available for a particular species, it was placed under "Remarks" instead of attempting to expand it into a paragraph of text. Sometimes, however, facts were placed in that section that seemed somewhat out of place in the text or to point up some aspect of the plant under discussion, such as how to distinguish it from a closely related species.

The Platt List. The earliest records of the Catskill flora are contained in the "Fifty-fourth Annual Report of the Regents of The University of the State of New York" (1841), where M. Platt, a teacher of natural science at the Delaware Literary Institute in the village of Franklin, Delaware County, listed some 380 "plants collected and examined, by the botanic class ... during the summer term of 1840." A note at the end of the list states that "the preceding plants were collected by the botanic class, during a term of eleven weeks, and by some of the class preserved and arranged in herbariums according to the natural system. The most approved names of modern botanists have been adopted." So far as is known, none of these specimens has survived the vicissitudes

of time. Platt, of course, was not writing a flora of the Catskills; he was not even attempting to compile a catalog of local plants. His list was merely intended to give some indication of the scope of the Institute's course in botany, which, even judged by modern standards, must have been quite comprehensive. Nevertheless, nearly 70 years were to elapse before any comparable study of the Catskill flora was to be made.

It can be assumed that most of the plants "collected and examined by the botanic class" in 1840 came from the local area: but a few of those listed have not since been reported either from Delaware County or from the Catskill region generally. It is therefore possible either that they were brought in by some of the students from sources outside the county, from gardens, or that some of them were not properly identified. In the absence of specimens, one of the writer's objectives has been to verify the occurrence in Delaware County of all the plants on the Platt list, particularly since that information was one of the sources used by the botany office at the State Museum in Albany in compiling an informal check list of the vascular flora of Delaware County. (For the record it can be stated that as of 31 December 1978 only 39 species on the Platt list remain unaccounted for.)

Other Records. Three decades elapsed before further interest in the Catskill flora was to be demonstrated, in part because the area was difficult of access during the first half of the century in spite of much road-building. Later the Civil War and its aftermath occupied men's energies to the exclusion of botany, so it was not until the railroads made travel to the Catskill region much easier that interest in the flora of this area became more apparent.

The earliest known preserved specimen from the Catskills is Taxus baccata ssp. canadensis, collected by J. H. Redfield at Hunter on 20 August 1869; next is Polygala paucifolia, collected by J.J.C. at Platterkill, also in Greene County, in June 1872. (Quite possibly earlier, but undated, specimens, collected near Catskill Mountain House in Greene County by Mrs. Charles Beach, are filed in the herbarium at St. Lawrence University.) Later that same year (1872) William H. Leggett collected Betula allegheniensis and Polygonum cilinode at High Peak, likewise in Greene County. Other records of this period include Elizabeth G. Knight's (later Mrs. Nathaniel Lord Britton) specimen of Polypodium virginianum collected at Hancock in 1874. She also visited Plattekill Cove (or Clove) and Lake Hill in 1877. Eugene P. Bicknell, perhaps the first professional botanist to explore the Catskills, collected in the vicinity of Pine Hill in 1880 and on Slide Mountain in 1881. Justus F. Poggenburg, also a professional botanist, made four visits to the Catskills (Platt Clove and Rondout in 1885, Overlook Mountain and Cohecton in 1887). In Delaware County E.H.D. collected Rubus hispidus at Hancock in 1878. That same year Charles H. Peck, first New York State botanist, reported Polystichum braunii as occurring near "Griffins" (Griffin Corners, now part of Fleischmanns), and an unknown botanist collected Ribes lacustre on Mt. Utsayantha in 1882.

Field workers visiting the Catskills during the 1890's include George V. Nash ("Forge" and Black Head in 1893), Dr. F. H. Kretz (Revonah

Lake in 1893 and Tannersville in 1894), Nathaniel L. Britton and no doubt his wife (Hunter in 1894: Phoenicia, Shandaken, and Slide Mountain in 1901), and David L. Topping (North and West Harpersfield in 1895). An amateur botanist, Topping also made two other visits to Delaware County, one in 1906 and another in 1920. He also collected extensively in Hawaii, Borneo, the Philippines, and Siberia. The most active person during this period, however, was Anna Murray Vail, a member of the Torrey Botanical Club and librarian at the New York Botanical Garden; she made extensive collections in Greene County at Tannersville, Platte Cove, and Onteora during the summers of 1891, 1892, and 1901.

But the first quarter of the 20th century witnessed more active interest in the flora of the Catskills than did the preceding century. Three people are primarily responsible for our knowledge of the flora of the area during this time, with members of the Torrey Botanical Club playing a prominent role. Anna M. Vail's already extensive work was followed by that of Norman Taylor, curator of botany at the Brooklyn Botanic Garden and author of the Flora of the Vicinity of New York; he collected numerous specimens in Stamford and Arkville in June, 1909. Then a botanical symposium held at Stamford the first week in July, 1909, sparked continued interest in the Catskill flora. Taylor, together with Philip Dowell, first editor of the American Fern Journal, took this occasion to climb Mt. Utsayantha and collect extensively in other localities near Stamford. Taylor also spent much of that summer in Greene County, collecting in the Windham and Tannersville areas.

The third person to contribute much to our knowledge of the Catskill flora before 1925 was Percy Wilson, curator of economic botany at the New York Botanical Garden. He visited Stamford in 1913 and collected extensively in Arkville in 1915, sometimes accompanied by Fanny A. Mulford, another member of the Torrey Botanical Club (she had already visited Deposit and Arkville in 1903). Wilson returned to the Catskills in 1918, this time to Sullivan County, collecting at Lake Shandalee and nearby areas during July and August. Unfortunately, most of his work could not be reflected in Taylor's Flora of the Vicinity of New York, which was published January 30, 1915. Other collectors, working mostly in Delaware and Ulster counties from 1900 through 1925, include Edmund N. Harvey, associate professor of botany at the University of Pennsylvania; George F. Cleveland, a member of the American Fern Society; and Herbert M. Denslow, a charter member of the Torrey Botanical Club and honorary curator of the local herbarium at the New York Botanical Garden. In addition, Aravilla M. Taylor, a member of the American Fern Society, visited relatives at a farm near Andes in 1923, reporting her finds in the American Fern Journal. Collectors visiting Greene County during this period include Eugene P. Bicknell, Per Axel Rydberg (another professional botanist), and William C. Ferguson.

The next twenty-five years, 1926-50, witnessed a gradual decline of interest in the Catskill flora among members of the Torrey Botanical Club, although that organization sponsored occasional field trips to the area until 1968. This same period, however, displayed increased activity in the Catskill area on the part of the botany office of the New York State Museum. Neil Hotchkiss, later wildlife biologist at the Patuxent Wildlife Research Center in Maryland, but in 1927 on the staff of the New York State

Museum, visited the Delhi region that summer, making a number of important collections and observations. The most active worker in the Catskill area during this period, however, was Mrs. Elsie G. Whitney, who made repeated visits to Delaware, Sullivan, and Ulster counties from 1929 through 1936. Although a member of the American Fern Society, her botanical interests were by no means restricted to the pteridophytes. Her collections are in the herbarium of the New York State Museum, where for some time she worked on the staff as assistant state botanist.

It was not until the third quarter-century, 1951-75, however, that knowledge of the flora of New York State (including the Catskill region) reached its peak in the work of the late Stanley J. Smith, curator of botany at the New York State Museum. As a field botanist he had few peers; his collections exceed 52,000 specimens, most of which were collected in New York State, and during this period he made some 40 excursions to the Catskill area alone, not only collecting specimens but making extensive observations as well. He was also instrumental in stimulating and encouraging amateur botanists to collect in local areas as a means of increasing our knowledge of the flora of the state, resulting in the publication of several county floras, one of which was The Flora of Ulster County, New York by Mary Domville and Henry F. Dunbar, published in 1970. This "Annotated List of Vascular Plants" is primarily a check list of the plants to be found growing in that county and was therefore not intended to provide distributional records. It must be noted, however, that many of their comments on the abundance of particular species apply more to the eastern than to the western half of that county.

One of the latest publications to deal specifically with the flora of the Catskills is Vegetational History of the Catskill High Peaks by Michael Kudish, a doctoral thesis submitted to the State University College of Forestry at Syracuse University in 1971. While there can be no doubt that Dr. Kudish has made a significant contribution to knowledge of the ecology of the high peaks of the Catskills, his survey pinpoints the location of not more than 30 species, so it does not add materially to knowledge of distribution of the various taxa making up the Catskill flora. In addition, Dr. Robert R. Smith, an associate professor at Hartwick College in Oneonta, and Richard K. Rabaler, one of his students, in 1976 published a Checklist of the Vascular Flora of Pine Lake, an area located near Davenport Center in Delaware County. This Checklist not only added no less than 70 species to those known to grow in that county, but also verified as occurring in Delaware County 9 species contained in the Platt list. All the Pine Lake area is situated in the glaciated Allegheny plateau, however, not in the Catskill region; their work therefore lies outside the scope of this work.

Some General Characteristics of the Catskill Flora. From a botanical point of view the flora of the Catskills largely represents that of the climax beech-birch-maple forest regions, with oak-hickory intruding up the valleys of the larger streams draining the area plus remnants of a more boreal flora on some of the higher peaks. One characteristic of the entire region is a spectacular spring flora nearly completing its entire life cycle in the few short weeks between the first warm days of spring

and the development of a heavy forest canopy that almost completely shades the forest floor. At that season Hepaticas are among the first flowers to bloom and soon afterward Spring Beauties literally carpet the ground in many areas. A walk through the woods in spring is, in addition, very likely to disclose an abundance of Dutchman's Breeches, Squirrel Corn, Blue Cohosh, Foam Flower, Two-leaved Bishop's-cap, Wild Ginger, Columbine, Baneberries, Bloodroot, Crinkle-root, Wood Anemone, Kidney-leaved Crow-foot, numerous species of violets, Dwarf Ginseng, Starflower, Wood Betony, Golden Ragwort, Jack-in-the-pulpit, and two woodrushes, as well as such members of the Lily family as Clinton's Wood Lily, Trout Lily, False Lily-of-the-valley, two trilliums, Bellwort, and False Solomon's Seal.

In addition to such remnants of an arctic-alpine flora as Lycopodium selago, Sedum rosea, Potentilla tridentata, and Solidago macrophylla, many native species making up the Catskill flora can be considered elements of a boreal flora, with distributions ranging from Greenland and/or Labrador to the Yukon and/or Alaska, many of which nearly reach their southern limits in the Catskills. When they are found farther south, their distributions are generally restricted to the higher elevations or to cold bogs and ravines. These boreal elements include the following taxa:

<i>Equisetum fluviatile</i>	<i>Mitella nuda</i>
<i>E. sylvaticum</i>	<i>Ribes lacustre</i>
<i>Lycopodium annotinum</i>	<i>R. triste</i>
<i>ssp. pungens</i>	<i>Amelanchier bartramiana</i>
<i>L. clavatum</i>	<i>Viola renifolia</i>
<i>L. inundatum</i>	<i>V. selkirkii</i>
<i>L. sabinaefolium</i>	<i>Circaea alpina</i>
<i>Botrychium multifidum</i>	<i>Epilobium adenocaulon</i>
<i>Dryopteris spinulosa</i>	<i>E. angustifolium</i>
<i>ssp. dilata</i>	<i>Heracleum lanatum</i>
<i>D. fragrans</i>	<i>Cornus canadensis</i>
<i>Matteuccia struthiopteris</i>	<i>Arctostaphylos uva-ursi</i>
<i>Polystichum braunii</i>	<i>Andromeda polifolia</i>
<i>var. purshii</i>	<i>ssp. glaucophylla</i>
<i>Thelypteris phegopteris</i>	<i>Kalmia polifolia</i>
<i>Woodsia glabella</i>	<i>Veronica scutellata</i>
<i>W. ilvensis</i>	<i>Galium trifidum</i>
<i>Abies balsamea</i>	<i>Linnaea borealis ssp. americana</i>
<i>Larix laricina</i>	<i>Poa nemoralis</i>
<i>Picea mariana</i>	<i>P. palustris</i>
<i>Populus balsamifera</i>	<i>Carex brunnescens</i>
<i>Betula alba</i>	<i>C. flava</i>
<i>ssp. papyrifera</i>	<i>C. pauciflora</i>
<i>Stellaria calycantha</i>	<i>Calla palustris</i>
<i>Actaea spicata ssp. rubra</i>	<i>Luzula parviflora</i>
<i>Caltha palustris</i>	<i>var. melanocarpa</i>
<i>Coptis trifolia</i>	<i>Sisyrinchium montanum</i>

The relationship of the Catskill flora to that of the southern states is perhaps somewhat less clear-cut, but a number of species occur from Florida to Louisiana and/or Texas and range northward at least to the latitude of the Catskills if not beyond. Even those that grow

farther to the north, however, have their centers of distribution well south of the Catskills and can on that account be considered elements of a southern flora, among which are the following species:

<i>Cheilanthes lanosa</i>	<i>Verbena hastata</i>
<i>Carya glabra</i>	<i>V. urticifolia</i>
<i>Alnus serrulata</i>	<i>Scutellaria integrifolia</i>
<i>Boehmeria cylindrica</i>	<i>Monarda fistulosa</i>
<i>Paronychia fastigiata</i>	<i>Collinsonia canadensis</i>
<i>Nuphar luteum</i>	<i>Lycopus virginicus</i>
ssp. <i>macrophyllum</i>	<i>Pedicularis canadensis</i>
<i>Podophyllum peltatum</i>	<i>Lobelia cardinalis</i>
<i>Liriodendron tulipifera</i>	<i>Krigia virginica</i>
<i>Arabis canadensis</i>	<i>Rudbeckia triloba</i>
<i>Platanus occidentalis</i>	<i>Solidago altissima</i>
<i>Amelanchier arborea</i>	<i>Aristida dichotoma</i>
<i>Apios americana</i>	<i>Eragrostis spectabilis</i>
<i>Euphorbia maculata</i>	<i>Muhlenbergia schreberi</i>
(or <i>E. nutans</i>)	<i>Panicum dichotomiflorum</i>
<i>Rhus copallina</i>	<i>P. linearifolium</i>
<i>Celastrus scandens</i>	<i>P. philadelphicum</i>
<i>Parthenocissus quinquefolia</i>	<i>Carex incomperta</i>
<i>Hypericum gentianoides</i>	<i>C. lupulina</i>
<i>H. mutilum</i>	<i>C. lurida</i>
<i>H. punctatum</i>	<i>Cyperus rivularis</i>
<i>Aralia spinosa</i>	<i>C. strigosus</i>
<i>Epigaea repens</i>	<i>Juncus acuminatus</i>
<i>Kalmia latifolia</i>	<i>J. marginatus</i>
<i>Rhododendron maximum</i>	<i>Lilium superbum</i>
<i>Vaccinium stamineum</i>	

At least two plants of the Catskills are not only extremely local in distribution but also have very disjunct ranges. *Aconitum noveboracense* was first collected in Chenango County in 1883 and was subsequently discovered also in Ulster County (and possibly in Orange County). It has perhaps the most restricted range of any plant in the Catskills, for it is known elsewhere only from northeastern Ohio and parts of Iowa and Wisconsin. In North America *Adoxa moschatellina* is known in the east only from the Catskill Mountains. In the midwest it grows in Iowa, Wisconsin, and Minnesota, where there occurs another break in range. Farther west it is found from New Mexico to South Dakota, north to the Yukon and Alaska, thence to Eurasia. Both plants can no doubt be considered relics of the glacial age, having had a more extensive range following the retreat of the glacier but because of subsequent changes in climate survive only in the niches they now occupy.

The Catskill flora also includes its share, some might say more than its share, of nearly cosmopolitan weeds, many of European or Eurasian origin, among which may be mentioned Soapwort, Chickweed, Shepherd's-purse, Field Bindweed, Dead-nettle or Henbit, Wild Marjoram, and Wild Thyme (other weeds of Eurasian origin are noted below). Among the weedy grasses brought from Europe may be included Cheat and one or two species of foxtail grasses. There is even one "weedy orchid" (*Epipactis helleborine*), but it can hardly be considered as a pest. Not all our serious

weeds came from Europe, however, for a number of them are native, including two species of false climbing buckwheats, Spotted Spurge, and Poison Ivy, as well as three or four species of rather aggressive goldenrods. The Red-rooted Pigweed (Amaranthus retroflexus) and Carpetweed, on the other hand, are adventive from tropical America, and the Small-flowered Galinsoga is naturalized from Mexico and South America.

From the standpoint of economics, these plants are in many respects as important as the more exotic elements of our flora, for they not only compete with more desirable elements of the native flora but they cost the farmer much time, effort, and money. Of interest also is the rapidity with which some of them are spreading. John Burroughs (Wiley, 1951) noted that Orange Hawkweed (Hieracium aurantiacum) was a rather uncommon plant in the Catskills during his boyhood; within 50 years it had invaded practically every pasture in the region. Less than 25 years ago the Giant Chickweed (Stellaria aquatica) was considered a rather rare plant; it is today frequently encountered in the Catskills and appears to be spreading rapidly. The Plumeless Thistle (Carduus acanthoides) was first discovered in the Catskill region near Margaretville in 1974. How long will it be before it becomes a common weed in that area?

Widespread Plants of the Catskills. In addition to those species discussed above, from 15 to 20 percent of the plants occurring in the Catskill region are so widespread that they have been recorded from, or can be expected to be found growing in, every township comprising the area. Among the widespread ferns and fern allies are the following species:

Equisetum arvense	Dennstaedtia punctilobula
Lycopodium complanatum	Dryopteris marginalis
ssp. flabelliforme	D. spinulosa ssp. intermedia
L. lucidulum	Onoclea sensibilis
Osmunda cinnamomea	Polystichum acrostichoides
O. claytoniana	Pteridium aquilinum
Athyrium filix-femina	ssp. latiusculum
ssp. angustum	Thelypteris noveboracensis

There are only two widely distributed conifers, and it seems unlikely that any others in that region can ever compete to the same degree:

Pinus strobus	Tsuga canadensis
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Trees and shrubs that can be expected in every township in the Catskill area include the following:

Populus grandidentata	Fagus grandifolia
P. tremuloides	Quercus rubra
Salix depressa ssp. rostrata	Ulmus americana
S. sericea	Hamamelis virginiana
Juglans cinerea	Prunus pensylvanica
Betula allegheniensis	P. serotina
Carpinus caroliniana	P. virginiana
Ostrya virginiana	Pyrus malus

Robina pseudo-acacia
Rhus typhina
Acer pensylvanicum
A. rubrum
A. saccharum
A. spicatum
Tilia americana

Cornus alternifolia
Fraxinus americana
Sambucus canadensis
S. racemosa ssp. pubens
Viburnum acerifolium
V. lantanoides

Other widespread woody plants include:

Clematis virginiana
Rubus allegheniensis
R. hispidus
R. idaeus ssp. strigosus
R. occidentalis
R. odoratus

Spiraea latifolia
Parthenocissus quinquefolia
Aralia nudicaulis
Vaccinium angustifolium
Diervilla lonicera

Other native plants, some of which are aggressive weeds, widely distributed throughout the Catskills include:

Urtica dioica ssp. gracilis
Polygonum cilinode
P. pensylvanicum
P. sagittatum
Thalictrum pubescens
Lepidium virginicum
Potentilla norvegica
ssp. momspeliensis
P. simplex
Geranium robertianum
Impatiens capensis
I. pallida
Epilobium adenocaulon
Oenothera biennis
Lysimachia ciliata
Trientalis borealis
Apocynum androsaemifolium
Asclepias syriaca
Convolvulus sepium
Hydrophyllum virginianum
Veronica officinalis
Mitchella repens

Lobelia inflata
Ambrosia artemisiaefolium
Anaphalis margaritacea
ssp. angustior
Aster macrophyllus
A. puniceus
A. umbellatus
Conyza canadensis
Erigeron annuus
E. pulchellus
E. strigosus
Eupatorium maculatum
E. perfoliatum
E. rugosum
Lactuca canadensis
Rudbeckia hirta
R. laciniata
Solidago bicolor
S. graminifolia
S. nemoralis
S. rugosa

Among the species adventive or introduced from Eurasia that have made themselves well at home in the Catskill region may be included the following plants. It will be noted that this list also includes its share of weeds, some of which were no doubt inadvertently brought with seeds from Europe, having been weeds of cultivated soil for many millennia. Some species were deliberately introduced to serve as food, fodder for farm animals, ornament, or medicinal purposes, while others are of much more recent introduction to the Catskills. For whatever reason these plants were introduced, they are now to be found widely distributed throughout the Catskill area.

Polygonum arenastrum	Daucus carota
P. persicaria	Pastinaca sativa
Rumex acetosella	Myosotis scorpioides
R. crispus	Nepeta hederacea
R. obtusifolius	Prunella vulgaris
Chenopodium album	Satureja vulgaris
Cerastium vulgatum	Solanum dulcamara
Lychnis alba	Linaria vulgaris
Silene cucubalus	Verbascum thapsus
Stellaria graminea	Plantago lanceolata
Ranunculus acris	P. major
Barbarea vulgaris	Galium mollugo
Sedum triphyllum	Dipsacus sylvestris
Fragaria vesca ssp. vesca	Achillea millefolium
Potentilla recta	Anthemis cotula
Coronilla varia	Arctium minus
Lotus corniculatus	Chrysanthemum leucanthemum
Medicago lupulina	Cichorium intybus
Melilotus alba	Cirsium arvense
M. officinalis	C. vulgare
Trifolium agrarium	Hieracium aurantiacum
T. hybridum	H. pratense
T. pratense	Matricaria matricarioides
T. repens	Taraxacum officinale
Malva moschata	Tragopogon pratensis
Hypericum perforatum	Tussilago farfara

The monocots likewise contribute quite a number of species that are widely distributed throughout the Catskill area, among which is

Typha latifolia

This species cannot be considered abundant in the Catskills, nowhere forming such extensive stands as may be found along the Hudson river, but small patches are widely scattered throughout the area. Several native grasses have also been recorded from, or may be expected to grow in, every township comprising the Catskill region:

Agropyron repens	Leersia oryzoides
Calamagrostis canadensis	Muhlenbergia frondosa
Festuca obtusa	Panicum capillare
Glyceria maxima ssp. grandis	P. implicatum
G. striata	Poa pratensis

About an equal number of grasses introduced from Eurasia have likewise become widely distributed in the Catskills, including

Anthoxanthum odoratum	Echinochloa crusgalli ssp. crusgalli
Arrhenatherum elatius	Festuca elatior
Bromus inermis	Phleum pratense
Dactylis glomerata	Setaria lutescens

Other widespread native monocots include:

Carex gynandra
C. lurida
C. pennsylvanica
Eleocharis obtusa
Scirpus atrocinctus
S. polyphyllus
Arisaema triphyllum
ssp. triphyllum

Juncus effusus
J. tenuis
Maianthemum canadense
Smilacina racemosa
Trillium erectum
Sisyrinchium montanum

The only other introduced monocot that has become widely distributed in the Catskill region, insofar as current records indicate, is

Hemerocallis fulva

It should be pointed out that these lists can by no means be considered complete. There is still much exploratory work to be done in the Catskills, even with respect to common and abundant elements of the flora. There are quite a number of additional candidates for the "Widespread Plants of the Catskills" category, both native and introduced, but at the moment it is not possible to state unequivocally that they can be expected in every township comprising the Catskill region.

Rare and Endangered Plants. For many years there has been increasing concern for the protection of endangered animal and plant species on a world-wide basis. In New York State this concern was crystallized during 1974 when the state legislature passed an amendment to the Environmental Conservation Law giving the State Department of Environmental Conservation authority to "promulgate and adopt a list of protected plants which by reason of their rarity, uniqueness, scarcity or endangered status should not be picked or removed from their natural habitat." The commissioner of the DEC subsequently appointed an Advisory Committee on Rare and Endangered Plants; by September 1 of that year this committee published a preliminary list of native plants which then became protected by law throughout the state. With respect to the Catskills, this list includes all native orchids, sundews, gentians, hollies, lilies, clubmosses, trilliums, and rhododendrons (including Mountain Laurel and Sheep Laurel or Lambkill). Also included among the protected plants are all ferns except for three weedy species, as well as Harebell, Water Chinquapin, Bittersweet, Trailing Arbutus, Cardinal Flower, Beebalm, Ginseng, Bloodroot, and Pitcher Plant. Under the new law "no one may knowingly pick, pluck, sever, remove or carry away, without the consent of the owner thereof, any protected plant." Violations of the law are punishable by fines of up to \$25 each.

Not all these species are rare in all sections of the state. Some, such as many of the ferns and clubmosses, for example, are actually quite common in the Catskills, where they are often found in abundance. They were given protected status to prevent commercial exploitation, as has happened in New Jersey, and elsewhere, where large areas have been denuded both of ferns and clubmosses to supply the metropolitan demand. As an example, it is reported that from around 1880 until 1905, whole families were accustomed to head for the Berkshires during the summer to collect wagonloads of fern fronds for shipment to metropolitan districts for use on meat counters and to supply florists with

greenery (a practice that still continues in the Taconics, at least with respect to the Fancy Fern). In that region this industry then centered around Hinsdale, where the farmers took their great loads of ferns, some of which brought "as high a price as \$2.50 a load." It was estimated that "more than 100,000,000 ferns are gathered each year and put in cold storage at Springfield," the annual harvest in that area alone being valued at \$50,000 a year, a considerable sum at that time. Even then embattled conservationists were contending with vested interests and in 1904 finally succeeded in introducing regulatory measures in the Massachusetts legislature to prevent the total extinction of ferns in the Berkshires. But it was a hard struggle, for ten years later it was reported that many firms both in New York and Massachusetts were still heavily engaged in the business of harvesting ferns.

The Appendix. The maps making up the Appendix show the distribution by township of all plants known to grow in the Catskill region. The day may well be close at hand when the contents of the various herbaria will be available by computer and one can simply press a button to determine what species of plants grow where. That not yet being the case, however, the writer has spent many hours going through herbarium specimens at the New York Botanical Garden and at the Brooklyn Botanic Garden, in addition to checking the distribution maps maintained by the New York State Museum in Albany, not only to compile a list of the species growing in that area but also to learn where, when, and by whom each species was collected. This information has been plotted on the distribution maps and substantiated by the data accompanying them.

The appointment by Governor Rockefeller of a Temporary Commission to Study the Catskills focused attention on the necessity for conserving the natural resources of that area and stimulated considerable interest in planning its future. Among other things, this commission became aware of the advisability of making adequate provision for the preservation of unique ecological areas, but that organization was not alone in that respect, for a number of other groups feel that it is imperative to assess completely the state's botanical heritage so as to guard against despoliation.

Even a casual glance through the Appendix will disclose the fact that many areas of the Catskills have not been well explored, at least in so far as its plant resources are concerned. It is therefore hoped that these maps will provide a sufficient stimulus to continued exploration of the Catskills to fill in gaps in our knowledge of the distribution of all plants in the area, not only to locate rare and endangered species, but also to learn more concerning the incursions of plants not native to this region.

From information contained in the Appendix, it should be a rather simple matter to compile a check list of the plants known to grow in any of the townships of the Catskills for use as a starting point in the continued exploration of that region. For many years amateurs have been making solid contributions to scientific knowledge, in part because of their enthusiasm and in part because they had the time to devote to a particular aspect of research. It is therefore much to be hoped that some interested resident in each of the townships will undertake a

detailed exploration of his region in order to extend our knowledge of the distribution of the flora in the Catskill region. We should then be in a better position to conserve the unique resources and scenic beauty of the Catskills for future generations.

Abbreviations. The following abbreviations are used primarily in the "plant biographies" and in the Appendix, for the most part without periods:

adv, adventive	Ind, Indiana
Afr, Africa, African	introd, introduced
Ak, Alaska	Jan, January
Ala, Alabama	Jct, junction
alt, altitude	Jul, July
Alta, Alberta	Jun, June
Am, America, American	Kan, Kansas
Apr, April	Ky, Kentucky
Ariz, Arizona	L, lake
Ark, Arkansas	La, Louisiana
Aug, August	Lab, Labrador
Austr, Australia	lb, pound
BC, British Columbia	LI, Long Island
BW, black-and-white photograph	m, meter
c, central	Mack, Mackenzie District
Cal, California	Man, Manitoba
cm, centimeter	Mar, March
Co, county, counties	Mass, Massachusetts
Col, Colorado	Md, Maryland
Ct, Connecticut	Me, Maine
cu, cubic	Mex, Mexico
cult, cultivation, cultivated	Mich, Michigan
DC, District of Columbia	Minn, Minnesota
Dec, December	Miss, Mississippi
Del, Delaware	mm, millimeter
distr, distribution	Mo, Missouri
dm, decimeter	Mont, Montana
e, east, eastern	Mt(s), Mount, mountains
eastw, eastward	n, north, northern
esc, escape, escaped	NAm, North America(n)
estab, established	natzd, naturalized
Eu, Europe	NB, New Brunswick
Feb, February	NC, North Carolina
fl, flower, flowering	n.d., no date
Fla, Florida	ND, North Dakota
fr, fruit, fruiting	NE, New England
frag, fragmentary	ne, northeast, northeastern
ft, foot	Neb, Nebraska
Ga, Georgia	Nev, Nevada
Gl, Greenland	Nf, Newfoundland
I, island	NH, New Hampshire
Ia, Iowa	NJ, New Jersey
Id, Idaho	NM, New Mexico
Ill, Illinois	n.n., no name
in., inch	northw, northward

Nov, November
 n.p., no place
 NS, Nova Scotia
 nw, northwest, northwestern
 NY, New York
 NYC, New York City
 NYS, New York State
 O, Ohio; Ohio State
 University
 Oct, October
 Okla, Oklahoma
 Ont, Ontario
 Ore, Oregon
 Pa, Pennsylvania
 Phil, Philadelphia Acad-
 emy of Sciences
 Que, Quebec
 R, river
 reg, region, regions
 RI, Rhode Island
 Rt, route
 s, south, southern
 SAm, South America(n)
 Sask, Saskatchewan
 SC, South Carolina
 SD, South Dakota
 sec(s), section(s)
 Sep, September

SI, Staten Island
 southw, southward
 southwestw, southwestward
 ssp., subspecies
 St, saint
 sw, southwest, southwestern
 T, transparency; i.e., a 35-mm
 slide in color
 Tenn, Tennessee
 Tex, Texas
 Trop, tropics, tropical
 US, United States
 Va, Virginia
 var., variety
 vic, vicinity
 Vt, Vermont
 w, west, western
 Wash, Washington
 westw, westward
 WI, West Indies
 Wis, Wisconsin
 wt, weight
 WVa, West Virginia
 Wyo, Wyoming
 x, a cross between two species, in-
 dicating a hybrid
 Yuk, Yukon Territory

Use of Technical Terms. Unhappily for the amateur, botanical literature is so rife with technical terms that it almost seems necessary to learn a new language in order to be able to read some of it with any degree of comprehension. The writer has tried (but probably not always succeeded very well) not only to keep the use of technical terms to a minimum but also to define those he does use when they first occur. Since glossaries of botanical terms are readily available in most of the field guides, to say nothing of the two more comprehensive ones given in Fernald (1950) and in Gleason (1952), the writer has made no attempt to compile a glossary for this work. In any case, recourse can always be had to Webster's Seventh New Collegiate Dictionary (1965), where most of them are defined. Should one wish to go further afield, George Usher's (1966) A Dictionary of Botany is an excellent reference.

This work contains many references to the medicinal applications of plants, in the course of which the use of a number of medical terms has been necessary. Such words are likely to be even more unfamiliar to the layman than are those relating more or less strictly to botany. While the definitions of most of the medical terms are likewise given in the dictionary, the following list, compiled in part from Krochmal et al. (1971), may be helpful.

Ague, an old word for fever, usually malaria.
 Allergenic, produces an allergy.
 Alterative, changes a condition gradually.

Amenorrhea, an abnormal absence or suppression of the menstrual discharge.
 Anodyne, relieves or quiets pain.
 Antacid, neutralizes excess acidity in the alimentary canal.
 Anthelmintic, capable of expelling or destroying intestinal worms.
 Antiasthmatic, relaxes bronchial muscles and relieves labored breathing.
 Antidote, counteracts the action of a poison.
 Antipruritic, prevents or relieves itching (antipsoriatic).
 Antipyretic, reduces fever.
 Antiseptic, checks or inhibits the growth of microorganisms.
 Antitussive, relieves or prevents coughing.
 Aperient, an agent that gently moves the bowels.
 Astringent, causes the contraction of tissue.
 Ataxia, an inability to coordinate voluntary muscular movements.
 Calculous, a mineral deposit or "stone," usually in the bladder or kidney.
 Carcinogenic, causing cancer.
 Carminative, used to relieve gas and colic.
 Catarrhal, related to inflammation of the respiratory tract.
 Cathartic, causes an evacuation of the bowel.
 Caustic, destroys tissue.
 Cholagogue, increases the flow of bile.
 Consumption, an old term for tuberculosis.
 Corroborant, an invigorating agent.
 Counterirritant, causes irritation of the surface of an area with the object of relieving a deep-seated congestion.
 Cystic, relating to the urinary bladder or to the gall bladder.
 Cystitis, inflammation of the urinary bladder.
 Cytotoxic, poisonous to cells.
 Decoction, an extract obtained by boiling.
 Demulcent, a substance used to protect or soothe the mucous membrane.
 Depurative, removes impurities and waste materials from the blood.
 Diaphoretic, used to increase perspiration.
 Disinfectant, destroys or inhibits the growth of harmful microorganisms.
 Diuretic, increases the volume of urine.
 Drastic, an agent that acts rapidly or violently.
 Dropsy, edema; i.e., an abnormal accumulation of serous fluid in bodily tissues (excess "water" in the common tongue).
 Dysentery, a disease characterized by severe diarrhea with passage of mucus and blood, usually caused by infection.
 Dyspepsia, a disturbed digestive condition characterized by nausea, gas, and heartburn.
 Emetic, an agent that causes vomiting.
 Emmenagogue, an agent that induces menstrual flow.
 Emollient, used externally to soften the skin and protect it.
 Excoriation, a peeling or wearing off of the skin.
 Expectorant, an agent that causes expulsion of mucus from the respiratory tract.
 Febrifuge, an agent that reduces fever.
 Flatulence, stomach discomfort caused by gas.
 Flux, an excessive abnormal discharge from the bowels.
 Gastritis, inflammation of the mucous membrane, particularly of the stomach.
 Hemoptysis, expectoration of blood from some part of the respiratory tract.
 Hemorrhage, a copious discharge of blood from the blood vessels; bleeding.
 Hemostatic, an agent used to stop internal hemorrhage.

Hepatic, of or pertaining to the liver.
 Herpetetic, pertaining to reptiles.
 Hypnotic, an agent that induces sleep without delirium.
 Infusion, an extract obtained by steeping or soaking in water, usually hot but not boiling.
 Irritant, causes inflammation of, or stimulation to, the tissues.
 Lumbago, painful muscular rheumatism usually involving the lower back.
 Menorrhagia, an abnormally profuse menstrual flow.
 Ophthalmiatric, used in the treatment of eye diseases.
 Pectoral, usually an expectorant, used for diseases of the chest and lungs.
 Peritonitis, inflammation of the tissues lining the abdominal cavity.
 Poultice, a soft, usually heated, medicinal substance spread on cloth and applied to the skin.
 Pressor, raising or tending to raise blood pressure.
 Pulmonary, pertaining to the lungs.
 Purgative, increases peristalsis (contraction of the bowel).
 Pustulant, causes severe irritation of the skin, especially the sweat glands.
 Refrigerant, allays thirst and gives a sensation of coolness to the body.
 Rickets, a childhood disease characterized by defective deposition and utilization of calcium and phosphorus owing to inadequate sunlight or vitamin D.
 Rubifacient, causes reddening and mild irritation of the skin.
 Scorbutic, relating to or resembling scurvy.
 Scurvy, a disease marked by spongy gums, loosening of teeth, and bleeding into the skin and mucous membranes resulting from a lack of ascorbic acid.
 Sialagogue, causes an increase in the flow of saliva.
 Somnifacient, produces sleep without delirium; a soporific.
 Soporific, tending to cause sleep.
 Stomachic, stimulates appetite and increases secretion of digestive juices.
 Styptic, an agent to check bleeding.
 Sudorific, increases perspiration.
 Taeniacide, an agent that destroys tapeworms.
 Tincture, a solution of a medicinal substance in alcohol.
 Tonic, stimulates the restoration of tone to the muscles.
 Vasoconstrictor, narrows the passageway of the blood vessels.
 Vermicide, an agent that destroys worms.
 Vermifuge, a substance to destroy or expel parasitic worms.
 Vesicant, causes irritation to the skin, resulting in blisters.
 Vulnerary, an agent that promotes healing of open wounds.

PTERIDOPHYTES

The Catskill pteridophytes are divided into three classes and six orders, as follows:

- Class 1. Articulatae
 - Order 1. Equisetales
 - Family Equisetaceae, the Horsetail Family
- Class 2. Lycopodiinae
 - Order 2. Lycopodiales
 - Family Lycopodiaceae, the Clubmoss Family
 - Order 3. Selaginellales
 - Family Selaginellaceae, the Selaginella Family
 - Order 4. Isoëtales
 - Family Isoëtaceae, the Quillwort Family
- Class 3. Filicinae
 - Order 5. Ophioglossales
 - Family Ophioglossaceae, the Grapefern Family
 - Order 6. Eufilicales
 - Family Osmundaceae, the Royal Fern Family
 - Family Schizaeaceae, the Curly Grass Family
 - Family Polypodiaceae, the Polypody or Fern Family

The pteridophytes have had a long history in medicine, for the medicinal qualities of ferns, real or imaginary, are mentioned as early as 300 B.C. by the Greek philosopher Theophrastus and by his Indian contemporaries Sushrut and Charak. Dioscorides also speaks of the Brake Fern, Male Fern, and others. In addition to these plants, there are about 40 species of pteridophytes used as drugs. Of these, Dryopteris filix-mas is included in the pharmacopoeias of many countries. Lycopodium clavatum is listed in the Indian Pharmaceutical Codex and in the proposed Indian Homeopathic Pharmacopoeia. Equisetum arvense is included in the pharmacopoeia of the USSR and in the German pharmacopoeia, and Puri (1970) has recommended its inclusion in the Indian Pharmacopoeia. In addition, some species of Adiantum are used unofficially in some of the patented cough preparations marketed in India and no doubt in other countries as well.

Key to Families of Local Pteridophytes

1. Stems conspicuously jointed, their nodes covered by sheaths composed of basally united scarious leaves, otherwise leafless; sporangia borne on inner surface of peltate scales in terminal spikelike cones..... Equisetaceae
1. Stems not conspicuously jointed, bearing green leaves or fernlike fronds, 2
2. Leaves small, very numerous and imbricated or grasslike and crowning a short cormlike stem; sporangia sessile, axillary or nearly so, 3
3. Stem short, thick and cormlike, crowned by a rosette of grasslike leaves: spores of two kinds..... Isoëtaceae

3. Stem elongate, covered by persistent small leaves; sporangia near base of upper leaf surfaces or in terminal bracted (when present) spikes or strobiles, 4
4. Leaves without a ligule, in 4-16 ranks; strobiles terete; spores uniform..... Lycopodiaceae
4. Leaves ligulate, in 4-6 ranks; strobiles (in ours) 4-sided; sporangia of 2 kinds, some containing very many minute microspores (male), others with fewer and larger macrospores (female)..... Selaginellaceae
2. Leaves (fronds) not closely imbricated, or, if very narrow and slightly imbricated, without axillary sporangia, 5
5. Fertile fronds or fertile portions of fronds similar to (though sometimes of different size from) the sterile Polypodiaceae
5. Fertile fronds or fertile portions of fronds conspicuously unlike the sterile, 6
6. Stipe twining, filiform; pinnae paired on alternate lateral stalks, the blades palmately lobed..... Lygodium
6. Stipe not twining nor usually filiform; fronds or parts of them not alternately paired, 7
7. Frond appearing forked; sterile half of frond simple, the fertile portion a long-stalked simple spike of 2 rows of coherent sporangia..... Ophioglossum
7. Frond not forked into fertile and sterile halves; sterile frond or portion of frond usually divided; fertile frond or portion of frond variously divided, 8
8. Sporangia naked; sterile frond or portion of frond divided (if simple, the small and weak plant with a single frond from a scarcely rhizomatous base); the fertile variously divided and with distinct globose sporangia, 9
9. Rhizome scarcely developed, the 1 or 2 fronds arising from above the fleshy roots; frond consisting of a sterile half and a fertile panicle or spike; sporangia 2-ranked, their walls of several layers..... Botrychium
9. Rhizome stout, the fronds clustered at its summit; sporangia not 2-ranked, with a single layer of cells..... Osmundaceae
8. Sporangia partly or wholly covered by the rolled-up modified pinnules, forming globular berry-like divisions of the stiff fertile frond; rhizome elongate, 10
10. Fronds in vasselike clumps, the tall sterile ones lanceolate and regularly pinnate, with free veins, surrounding the simple pinnate fertile ones Matteuccia
10. Fronds solitary or scattered, the sterile ones coarsely pinnatifid and deltoid-ovate, with veins forming a mesh, the fertile bipinnate... Onoclea

EQUISETALES

This group of plants stands apart from other vascular cryptogams, having no close affinities with them, and is derived from ancestors of great antiquity that once dominated the earth's flora in the Paleozoic era. Plants of this order are distinguished from other orders by their rushlike, often branching axes, jointed and mostly hollow stems, mostly minute and toothlike leaves whorled at the nodes, and reproductive bodies in conical or spikelike terminal cones with sporangia borne on the underside of peltate scales. Large plants of this order no doubt formed a large proportion of the vegetation during the Carboniferous period, the well-known Calamites being the stems of gigantic Equisetales, which during this period attained their maximum development; those now surviving are mere dwarf remnants.

This order contains only one family, the Equisetaceae. Most phylogenists have considered the horsetails among the most primitive of living vascular plants, but, despite lack of a definite bridging to ancestral types, there is evidence to indicate that the various species of Equisetum are relics of probably highly developed ancestral types, having strong affinities with the Calamitales and Sphenophyllales of the Carboniferous era.

EQUISETACEAE, the Horsetail Family

This family includes only one genus, Equisetum. In their general structure the horsetails have little resemblance to other plants. The stems are jointed, hollow except at the joints, and noticeable for their lack of differentiation from the underground portion of the plant, the construction of which, from the subterranean rootstock to the tip of the aerial shoot, may be likened to a line of drainpipe, each section of which fits into the slightly flaring top of the one below it. In all species the rootstock is perennial, and in some species the aerial stems last for several years while in others all traces of them above ground disappear soon after the first hard frost.

This family, once much used for polishing woods and scouring utensils, is of diminishing economic importance. Several species are noxious weeds of poorly drained soils, but a few species have been advertised by domestic dealers in native plants.

Equisetum L. Horsetail, Scouring Rush.

There are about 25 species of Equisetum occurring on all the large land masses of the earth except Australia and New Zealand. They are primarily plants of wet places, although one or two species grow in the driest of habitats. The majority of species occurs in the tropics and subtropics, with about 12 species more or less widely distributed over temperate North America. The name of the genus is derived from the Latin equus, horse, and seta, bristle, in allusion to the many slender branches of certain species, which give the plants a certain resemblance to the tail of a horse.

The equisetums are primitive plants, having been on the earth, according to the best authorities, for an estimated 300 million years. Few genera can boast of being older than Equisetum, although Lycopodium was declining when the scouring-rushes were young. While classed among the "fern allies," this genus comprises an essentially isolated group.

Several species of Equisetum have been used medicinally; the older herbalists considered them useful vulneraries and recommended them in the treatment of consumption and dysentery. Among the American Indians the Thompson tribe of British Columbia applied the ashes of horsetail stems to serious burns and then bandaged the wound with a clean cloth. Sometimes animal fats were mixed with the ashes to prepare an ointment for burns. The Cowlitz tribe in Washington cooked portions of the root stalk of the Giant Horsetail as food. In New Mexico the Hopi Indians mixed the dried ground stems of E. laevigatum with corn meal and ate it as a mush or baked it as bread. Rafinesque speaks of a tall species, called Nebratah by the Missouri Indians, used in the manufacture of mats, and of a species which he named E. tuberosum, the roots of which were used as food by the Indians. It is said that the ancient Romans ate some species for the starch which they contain. Horsetails have sometimes been recommended as survival food. Since some species contain a nerve poison, however, plus the fact that other plants offer much more both by way of palatability and nutrition, they are best avoided.

While often planted in California, these plants are elsewhere of little value horticulturally except perhaps for occasional planting by the side of a large pond. This genus is also of limited value to wildlife, although moose do browse on the plants. Geese and swans consume rootstocks and stems, and both the black bear and muskrats are known to eat some species.

Some members of this genus contain equisetine, an alkaloid that has been responsible for poisoning in livestock. Cases of Equisetum toxicity to stock in the United States and Canada have been reported from time to time since the late 1800's. The largest number of reported cases concerns poisoning of horses by Equisetum arvense obtained in hay, although cases in sheep have also been mentioned. Equisetum palustre and E. hyemale have also been reported to poison farm animals.

Key to Catskill Species of Equisetum

1. Stems perennial, mostly evergreen, stiff and harsh, simple or sparingly branched; cone tipped by a firm dark point; (sheaths cylindric, not much longer than broad, with basal and apical dark bands, the teeth deciduous or persistent)..... E. hyemale
1. Stems annual, with or without regular verticils of branches; cones rounded at summit; teeth of the nodal sheaths persistent, 2
 2. Fertile and sterile stems different, the early ones fertile, more or less succulent, brown or flesh-colored, the later stems sterile, much branched, greener, 3
 3. Teeth of the sheaths on the main stem black, moderately firm, scarcely cohering; fertile stem succulent, unbranched, soon perishing; branches of sterile stem divergent

- to ascending, not strongly recurving at tips, subsimple; internodes of sterile stem smoothish (sheaths of branches with lance-attenuate teeth)..... E. arvense
3. Teeth on the main stem light brown, subscarious, cohering into 3 or 4 compound lobes; fertile stems at length branched and persisting; branches of sterile stems profusely branched, at first with recurving tips, later sometimes less recurved to ascending; ridges of male sterile stem rough from 2 rows of hooked spicules..... E. sylvaticum
2. Fertile and sterile stems similar, simple or branching, green; fertile stems not developing in advance of sterile ones, 4
4. Centrum one-half to two-thirds diameter of main stem, more or less star-shaped; vacuoles well developed; sheaths becoming loose, with their narrowly white-margined teeth often united in 2's and 3's; spores abortive..... E. x litorale
4. Centrum four-fifths diameter of main stem, round in outline; vacuoles wanting or minute; sheaths tight, their 15-20 dark brown teeth distinct; spores fertile..... E. fluviatile

Equisetum arvense L. Field Horsetail.

Meaning of Species Name. Of cultivated fields.

Other Names. Common Horsetail, Devil's-guts, Cornfield Horsetail, Corn Horsetail, Bottle-brush, Horse-pipes, Snake-pipes, Snake-grass, Cat's-tail, Mare's-tail, Colt's-tail, Foxtail, Foxtail-rush, Pine-top, Pine-grass, Meadow Pine, Jointed Rush, Toad-pipes, Paddock pipes, Tad-pipes, Horsetail Fern, Scouring Rush, Scrubgrass, Frog-pipes.

Type of Plant. A perennial herb, reproducing by spores and creeping tuber-bearing rootstocks.

Habitat. Streambanks, sterile meadows, embankments, roadsides, and damp open woods and thickets in various types of soil.

Range. Almost throughout the US and Canada; also in Eurasia.

Distr in NYS. Very common.

Distr in the Torrey Range. Scattered throughout.

Elevation. Up to 2500 ft in Va.

Time of Fr. Mar-Jun; Apr-May 15 at Cornell.

Origin. Native.

Without question, the Field Horsetail is the most abundant species of Equisetum in the world. It can adapt itself to a wide variety of situations and is often found where few other plants can exist. The emerging fertile shoots, one of the first signs of returning spring, are a most welcome sight, but they soon disappear. The sterile stems develop later and persist until autumn. As might be expected, a plant as abundant as the Field Horsetail has a large number of common names applied to it because of the use, appearance, or habitat of the plant.

The Lower Chinook Indians of Washington are reported to have eaten the peeled raw stems of young shoots of a "field horsetail," but there is a strong possibility that it could not have been this species. Indians of California, however, used this plant medicinally, applying its ashes to mouth sores.

Grieve (1967) states that this is the species that is still generally collected in Great Britain and sold for medicinal purposes. Only the sterile stems are used medicinally; they are used in their entirety, cut off just above the root. The herb is used either fresh or dried but is said to be most efficacious when fresh. Not only is a fluid extract prepared from it, but the ashes of the plant are also employed. E. arvense acts as a diuretic and astringent, being once considered beneficial in the treatment of dropsy, gravel, and kidney affections generally; a drachm of the dried herb, powdered, taken three or four times a day, was considered effectual in "spitting of blood." The ashes of the plant have been considered valuable in treating acidity of the stomach and dyspepsia, administered in doses of 3 to 10 grains. Besides being thought useful in kidney and bladder trouble, a strong decoction acts as an emmenagogue; being cooling and astringent, it has been used in treating hemorrhage, cystic ulceration, and ulcers in the urinary passages. The decoction applied externally has been used to stop the bleeding of wounds; it was also applied to eyelids to reduce swelling.

Horsetail was formerly official under the name of Cauda equine for use as an astringent. Culpepper quotes Galen in saying that it will heal sinews, "though they be cut in sunder," and speaks of it highly for bleeding of the nose, a use to which it is still put by country people. Puri (1970) states that in India "Herba Equisiti Arvensis" has diuretic and astringent qualities, found quite useful for urinary and bladder diseases, and for stopping the flow of blood in urine. An oral administration is reported to produce a decided increase in blood corpuscles. The plant is also used in India to treat acidity of the stomach and dyspepsia. Although the horsetails were little used in American medicine, the Field Horsetail contains equisetetic acid, thought to be identical with aconitic acid. This substance is a potent heart and nerve sedative, a dangerous poison when taken in high doses.

8
This species is a most useful dye plant, not only because it produces a pleasing yellow color, but because it also makes an excellent base for top-dyeing with other colors. A "generous basket" of the young green plants is gathered in spring, discarding all roots. The plants are then placed in a granite pot filled with rainwater. About one-tenth the weight of mordanted wool (using the standard alum mordanting method) is added in alternate layers with the horsetails, then simmered for half an hour, after which it is rinsed well in warm water and dried in the shade. Any of the dyed wool not used as yellow yarn can be kept until later in the season to top-dye with various other plants. The light yellowish color seems to brighten and improve the colors obtained from other dye plants such as madder, lupine, birch leaves, and tansy, as well as others. Top-dyeing with a small amount of indigo gives a lovely pale green. In Lapland a yellow color is obtained with an alum mordant and very little boiling; iron vitriol (ferrous sulfate) gives a gray-green, and copper sulfate results in grass green. If the kettle is aluminum or zinc, it gives a green color after 2 hours with or without boiling.

Cattle can graze on the fresh plant with impunity; when it is cut with hay, however, it has been found to be poisonous. When horses or cattle are fed on hay containing large quantities of this plant, they become sick with a disease known as "equisetosis." The species is rarely,



Equisetum arvense--Field Horsetail
[From USDA Agr. Research Sv. (1971), Fig. 2, p. 7.]

if ever, lethal to cattle, sheep, or goats. Kingsbury (1964) states that the largest number of reported cases concerns poisoning of horses by E. arvense obtained in hay, although cases in sheep have been mentioned. Hay composed of one-fifth or more of Field Horsetail produces symptoms of poisoning in horses in 2 to 5 weeks; unthriftiness is followed by weakness, ataxia, and difficulty in turning, but the appetite remains normal almost to the end. Removing the offending hay in the early stages of poisoning brings about rapid recovery. Treatment with massive doses of thiamine is also effective in all but the final stages when the animal is prostrated. It appears dangerous only in hay, where toxicity is not lost with age; also the young green growth appears more dangerous than older plants. It has been found that horses may develop an appetite for this species, eating it from their bedding in preference to clean hay provided them.

A deep-seated root system with tuberous storage organs makes this species very difficult to eradicate in areas where it has become a noxious weed. It is very tenacious for, even if buried 6 feet or more in loose soil, it will ultimately reach the surface again; even young shoots can easily penetrate asphalt sidewalks and roads. All roots should therefore be forked out and the ground hoed frequently in cultivated areas. Improved drainage, clean cultivation, and the application of fertilizer to stimulate crop plants will gradually drive it out.

Equisetum fluviatile L. Water Horsetail.

Meaning of Species Name. Of a river.

Other Names. Pipes, Swamp Horsetail, Paddock-pipes, Mud Horsetail, Joint-grass, Frog's-pipes.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Shallow water, wet shores, meadows, and swales.

Range. Nf to Ak, s to Del, Va, O, Ind, Ill, Ia, Neb, Wyo, and Ore; also in Eurasia.

Distr in NYS. Frequent in the s counties of the state, infrequent from Wayne co westw, rare or local in e NY, and rare in the Mohawk valley; frequent across the n part of the state.

Distr in the Torrey Range. Scattered throughout except in the Pine barrens and the reg e and s of them, there not recorded.

Time of Fr. Jun-Aug; May 25-Jun at Cornell.

Origin. Native.

This species is readily eaten by cattle and is said to be fed to cows in the northern part of Sweden to increase the flow of milk, but horses will normally not touch it. Linnaeus stated that in Lapland reindeer eat it even when dried, though they will not touch hay, and he recommended that it be gathered and preserved with reindeer-moss for winter use. When abundant it has sometimes been cut for hay in America. Muskrats are very fond of the young stems and often work much havoc among them just as they are pushing up to the surface of the water.

E. fluviatile has very little silica in its outer coat and is one of the smoothest species of the genus. It is recorded that the poorer classes among the Romans occasionally ate it as a vegetable, but it is neither particularly palatable nor very nutritious. As reported by Sturtevant (1919), Coles, speaking of horsetails in his Adam in Eden,



Equisetum fluviatile--Water Horsetail
 [From Billington (1952), Fig. 6, p. 82.]

remarked that "the young heads are dressed by some like asparagus, or being boiled are often bestrewn with flour and fried to be eaten."

This is a polymorphic species and in some of its disguises is hard to identify. Its irregular branching and appressed sheaths are its most characteristic features. In addition, the stem is hollow for about four-fifths of its diameter; no other species resembles it in this respect.

Equisetum hyemale L. ssp. affine (Engelm.) Stone. Winter Scouring Rush.

Meaning of Species Name. Of winter, because evergreen: ssp. name, allied.

Other Names. Horse-pipes, Mare's-tail, Shave-grass, Shave-weed, Polishing-rush, Naked Horsetail, Joint-rush, Joint-grass, Snakeweed, Pewterwort, Rough Horsetail, Dutch Rush, Gun-bright, Scrub-grass, Mountain-rush, Winter-rush, Bamboo, Jointed-rush, Common Scouring Rush, Snake-rush.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Dry or moist sandy banks, shores, roadsides, railroad embankments, open woods, and the like.

Range. Nf to Ak, s to Ga, Tex, NM, Col, and Wash.

Distr in NYS. Very common.

Distr in the Torrey Range. Scattered throughout the range except in the pine barrens and the reg e and s of them, there not recorded.

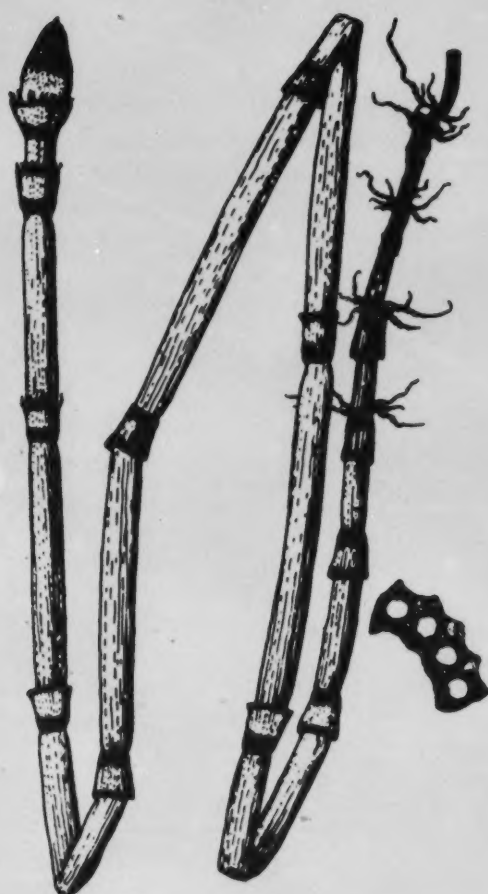
Time of Fr. Jun-Aug; May-Sep at Cornell.

Origin. Native.

Remarks. Considered the most abundant of our evergreen species; House (1924) states that it is "very common" in New York State, but it is a rare plant in the Catskills.

The rough and flinty exterior of this species makes it useful for scouring and polishing, from which it derives its name of Scouring Rush. Before sandpapers and other scouring and polishing materials were generally available, the common Scouring Rush was used extensively in their stead, so that it was once of prime importance in domestic affairs, being used for cleaning pots, pans, floors, and woodwork. Cabinet-makers and others found many uses for it, and it was at one time so generally used in England that supplies were imported from Holland, hence the popular name Dutch Rush. Gerard states that in his time it was employed for scouring pewter and wooden kitchen utensils and that fletchers and comb-makers rubbed and polished their work with it. And it was, of course, similarly employed in colonial America. Long after Gerard's day, however, dairymaids of the northern counties of England used it for scouring their milk-pails. With the advent of scouring soaps, sandpaper, and other abrasives, however, it has largely fallen into disuse, but even now camping enthusiasts might well like to try it in the kitchen or for emergency use in cleaning utensils. At one time this species was planted on the dikes in Holland, its long branching rootstocks serving to prevent the soil from washing away.

The Scouring Rush was used in many ways by Indians of the western United States. The stalks were boiled by Indians inhabiting Washington and the resulting decoction employed as a hair wash and to eliminate fleas, lice, and mites. Densmore (1926-27) reports that among the Chipewas the stalks were burned and the ash was applied to wounds as a disinfectant. To cure diarrhea, the heads of the reproductive shoots were eaten by the Makah Indians, a tribe of the western states. This plant was also used ceremonially, and the tough stalk was used as an abrasive for scouring and sharpening arrows and mussel shells. J. Lindley, writing in 1849, stated that this species often served as food in time of famine, and another authority remarked that the young fruiting cones, boiled and fried,

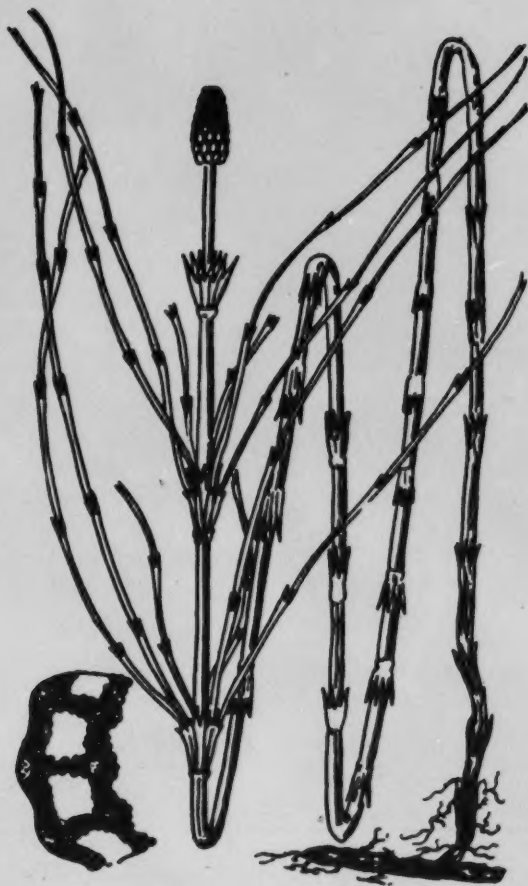


Equisetum hyemale ssp. *affine*--Winter Scouring Rush
[From Small (1935), p. 201.]

have been used as food. Because of a nerve poison contained in this genus, however, they should be avoided as articles of food, even in times of emergency.

The juice of this plant was once thought to be useful in nose-bleed and as an application to wounds. It had the reputation of being diuretic and was sometimes used in dropsical diseases and those of the urinary passages. The whole plant was employed, usually in the form of an infusion or a tincture.

Linnaeus mentioned that this species, among others, formed excellent food for horses in some parts of Sweden, but suggested that cows are apt to lose their teeth by feeding on it and that they were often afflicted with diarrhea. Actually, cows usually avoid these plants and will eat them only in the absence of better forage. Rafinesque likewise stated that "This plant, and allied species, furnish good food for cattle in winter." It is said, however, that where cattle have been given too large quantities of an infusion as a diuretic, it has caused the voidance of blood.



Equisetum x litorale--Shore Horsetail
[From Small (1935), p. 194.]

Equisetum x litorale Kuhl. (*E. arvense* x *E. fluviatile*) Shore Horsetail.

Meaning of Species Name. Of the shore.

Other Names. Joint-grass.

Type of Plant. A perennial herb.

Habitat. Wet shores, ditches, swales, and the like.

Range. Que to BC, s to NJ, Pa, Mich, Wis, Minn, and Wash; also in Eu.

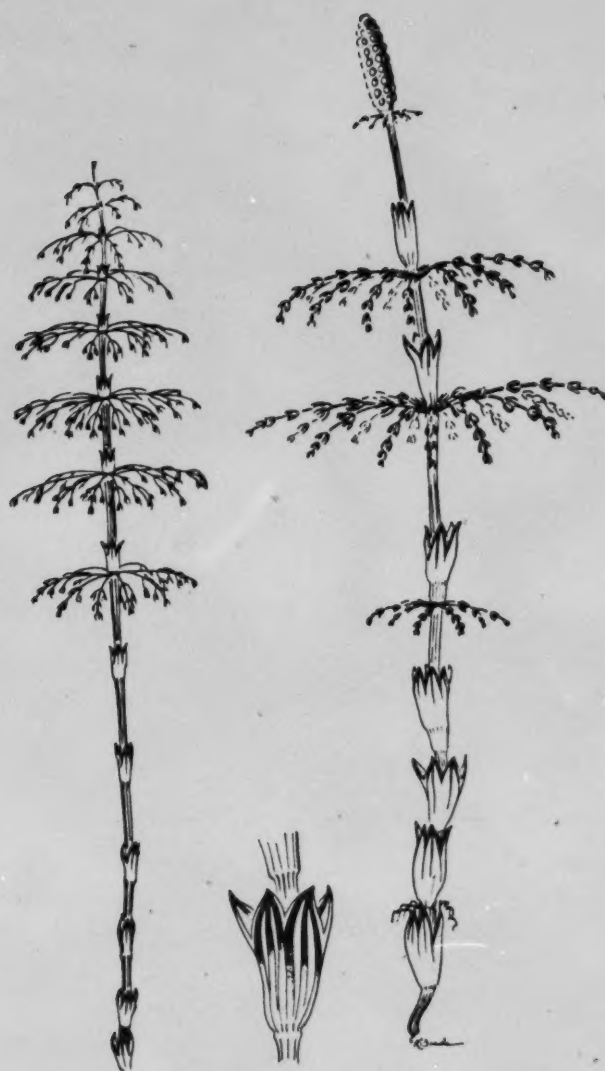
Distr in NYS. Local.

Distr in the Torrey Range. Known only from the banks of the Delaware in Hunterdon and Warren co, NJ, and Bucks and Delaware Co, Pa.

Time of Fr. Jun-Jul.

Origin. Native.

This hybrid presents a most perplexing series of forms and appears never to be twice alike. It often occurs in great abundance notwithstanding the abortive spores, since it spreads rapidly by means of its rootstocks. In some areas it is so abundant as to be cut for hay under the



Equisetum sylvaticum--Wood Horsetail
[From Billington (1952), Fig. 4, p 78.]

name "Joint-grass." In stems of *E. x littorale* the cross-section presents a starlike opening, while that of *E. fluviatile* is larger and circular.

Equisetum sylvaticum L. Wood Horsetail.

Meaning of Species Name. Of woodland.

Other Names. Bottlebrush.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Cool moist woods, thickets, and openings in subacid soil.

Range. Gl and Lab to Ak, s to Md, Pa, WV, Ky, O, Mich, Wis, Ia,

SD, and BC; also in Eurasia.

Distr in NYS. Locally abundant in most secs of the state, especially northw.

Distr in the Torrey Range. Scattered throughout most parts of our range.

Time of Fr. May-Jun; May-Jun 10 at Cornell.

Origin. Native.

The Wood Horsetail is without question the handsomest of the equisetums. The fine and slender branchlets with drooping tips make the whole frond exceedingly delicate and graceful. It is the only species in which the branches are again regularly branched; in some cases even the secondary branches are again branched. The plant will flourish in a shaded rock garden and other cultivated situations if given plenty of moisture.

Linnaeus reported that in some parts of Sweden this species was a principal food for horses; in northern Europe it is still sometimes preserved for winter fodder. It has likewise been used medicinally in the same manner as E. arvense. In Norway the Wood Horsetail is used to obtain beautiful grayish-yellow dyes. The segmented stems with their sprays of green branches are easily picked in July and August when they are fully developed. They can then either be dried or used immediately.

LYCOPODIÀLES

This order consists of a single family, the Lycopodiaceae. The lycopodiums of the present are mere remnants of the past; during the Carboniferous Period they were most luxuriant and various forms attained the height of trees. The order is characterized by the stems mostly elongate, creeping, and more or less indeterminate, the leaves scale-like to acicular, very short and mostly imbricated and crowded, the roots dichotomous, the sporangia solitary, each subtended by a sporophyll, these often condensed into terminal strobili.

LYCOPODIÀCEAE, the Clubmoss Family

This family consists of two genera, Phylloglossum, a rare monotypic genus restricted to parts of Australia and New Zealand, and Lycopodium, occurring over most of the earth except the most arid areas, most abundant in tropical and subtropical forests. The tropical species of Lycopodium are predominantly epiphytes, while those of temperate and arctic regions are terrestrial. Some 12 species are native to the eastern United States. As the stem continues to add to its length at the growing tip, it as slowly dies at the other extremity; the plants year by year thus appear to move slowly forward, never occupying quite the same position for two successive seasons.

Several species were once extensively gathered commercially for decorative purposes during the Christmas season. The steadily increasing demand for such greenery pushed several of the more decorative species to the verge of extinction in some areas, since they reproduce very slowly. The spores were formerly used commercially by druggists as pill coatings to keep the pills from sticking together, as well as in a number of official medicinal preparations. The spores have also been extensively used in fireworks under the names of vegetable brimstone and vegetable sulphur.

Lycopodium L. Clubmoss.

These are evergreen perennial herbs of varied habit, creeping, shrubby, or epiphytic, with a mosslike appearance and one-nerved "leaves" imbricated or crowded in 4-16 ranks. There are about 600 species distributed over much of the world, but they are most numerous in tropical mountains. They are asexually reproduced by spores borne, in most species, in little "cones" at the tips of the shoots. The name of the genus is derived from the Greek lukos, wolf, and pous, foot, possibly from a fancied resemblance, according to some authorities, but perhaps from their growing in wild and inhospitable regions where only a wolf is likely to tread.

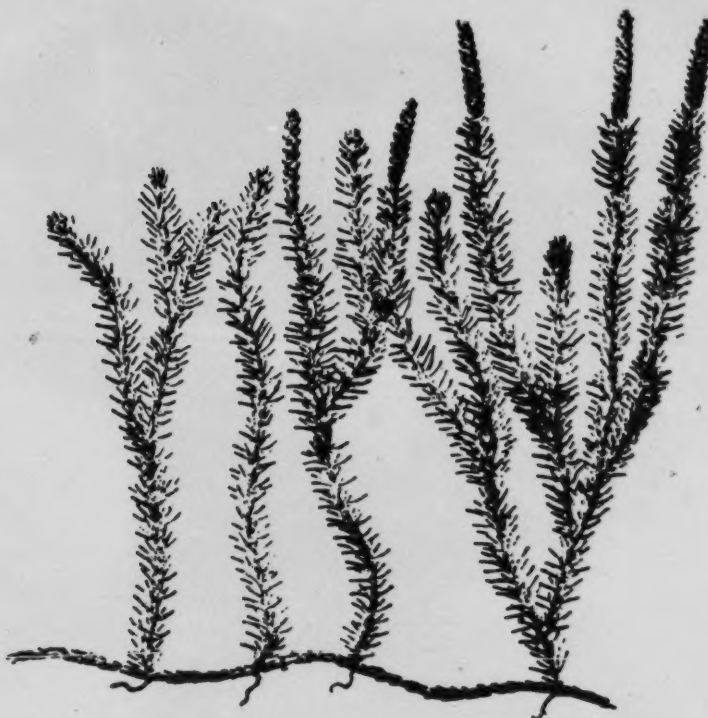
Various species of Lycopodium have been used as dye plants. In Norway the trailing lycopodiums were so used, either collected in the spring for drying or used fresh all year long. The grayish-yellow color that resulted was used mostly as a base for other colors. Several

species were also employed medicinally for their astringent and emetic properties, but their effects are too violent to entitle them to a place among current drugs. The spores of some species, chiefly L. clavatum, form lycopodium powder, which is yellow in color and very flammable; at one time this was used in theaters to produce artificial lightning. Everett (1960) states that some species from tropical regions are grown in greenhouses. The more hardy species can be grown in cool greenhouses or terrariums, and some make attractive ground-cover plants, among which are L. obscurum, L. clavatum, and L. complanatum.

Key to Local Species of Lycopodium

1. Sporangia borne in the axils of ordinary leaves, not forming a well-marked terminal spike but occurring in zones along the stems, alternating with sterile zones; stems not extensively creeping, forked, 2
 2. Leaves broadest at base, nearly entire, erect or spreading, 3-7 mm long; sporangia 1-1.5 mm wide at base..... L. selago
 2. Leaves broadest above the middle, obviously toothed, widely spreading or deflexed, 7-12 mm long; sporangia 1.5-1.8 mm wide..... L. lucidulum
1. Sporangia borne in the axils of the upper leaves, which are modified and bractlike, the whole forming a dense terminal spike; stems often long-creeping, variously branched, 3
 3. Sporophylls green and leaflike, their bracts similar to the foliage leaves in form and texture (leaves of the erect stem ascending, relatively few)..... L. inundatum
 3. Sporophylls yellowish, scalelike, their bracts very different from the leaves of the sterile parts of the stem, broader and shorter than the leaves, 4
 4. Sterile branches convex and uniformly leafy on all sides; branches not fan-shaped nor fastigiately branched; sterile leaves entire, denticulate, or ciliate, 5
 5. Spikes 1-4 on a slender scaly peduncle; leaves bristle tipped (creeping stems on or near surface of the ground)..... L. clavatum
 1. Fertile branches leafy up to the usually solitary spikes; leaves merely acute, not bristle-tipped, 6
 6. Creeping stem deep in the ground, the upright branches treelike, repeatedly forked..... L. obscurum
 6. Creeping stem on or near the surface of the ground, its numerous erect branches sparingly or not at all branched..... L. annotinum
 4. Sterile branches flattened or concave beneath, fan-shaped or fastigiately branched, the leaves usually reduced or modified on the lower surface (except in L. obscurum); sterile leaves entire, 7
 7. Spikes sessile; leaves 3-5 mm long..... L. obscurum
 7. Spikes borne on a slender scaly peduncle; leaves strongly decurrent, the free part of the lateral leaves 0.5-2 mm long, that of the dorsal and ventral leaves smaller; branches flattened, 8

8. Leaves of dorsal and ventral ranks similar; lateral leaves adnate for about half their length; peduncles leafy.. L. sabinaefolium
8. Leaves of the ventral rank reduced in size; lateral leaves adnate for more than half their length; peduncles with bract-like distant leaves, 9
9. Creeping stems at or near the surface of the ground; branchlets strongly dorsiventral, the leaves on the lower surface much smaller than the lateral ones; plants yellowish-green..... L. complanatum
9. Creeping stems rather deeply buried; leaves on the lower side of the branchlets scarcely smaller than the others; plants bluish-green..... L. tristachyum



Lycopodium annotinum ssp. *annotinum*--Bristly Clubmoss
[From Clute (1905), plate facing p. 86.]

Lycopodium annotinum L. ssp. annotinum. Bristly Clubmoss.

Meaning of Species Name. A year old, from the clearly marked separation of each year's growth of the ascending branches.

Other Names. Stiff Clubmoss, Interrupted Clubmoss, Northern Bear's-bed.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Woods, clearings, and bog margins in acid soil.

Range. Lab to Ak, s to NJ, Pa, upland to Va and WVa, Mich, Wis, Minn, Col, and Ore; also in Eurasia.

Distr in NYS. Common throughout the Adirondack and Catskill mts; elsewhere rather local, southw to Chenango, Broome, and Tioga co, westw to Oswego and Monroe co.

Distr in the Torrey Range. NY: In the Catskills.

Elevation. Sea level-3980 ft in the Torrey range.

Time of Fr. Late July-early Oct; Aug-Sep at Cornell.

Origin. Native.

At the ends of the branches the tips of the leaves point upward, but below this they are more spreading. As the new season's growth springs from the midst of the erect leaves, there are, in consequence, alternating zones on the branches in which the leaves are spreading or appressed, each appressed zone marking the ending of one season's growth and the beginning of another, hence one of its common names, Interrupted Clubmoss.

Lycopodium annotinum L. ssp. pungens (La Pylaie) Hult.

Meaning of Species Name. A year old; ssp. name, pungent.

Synonyms. L. annotinum L. var. pungens (La Pylaie) Desv. in Fernald (1950) and in Gleason (1952).

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Exposed rocky or peaty habitats.

Range. Gl and n Lab to Ak, s in the higher mts of NE, NY, and Pa to Wis, Minn, and Sask; also in ne Asia.

Distr in NYS. Common at higher altitudes.

Distr in the Torrey Range. Not differentiated from ssp. annotinum in Taylor (1915).

Time of Fr. Jul-Oct.

Origin. Native.

Of this subspecies, Clute (1905) remarks that "In the far North, and on mountain tops in milder regions, there is a form of this species called variety pungens.... It is in all ways a more compact plant than the type, the differences, without doubt, being due to the cold and exposure to which it is subjected." This subspecies has been collected only once in the Catskill region (see Appendix), but it should be looked for on the higher peaks elsewhere in that area. The two subspecies can be distinguished as follows:

1. Leaves of fruiting branches 5.5-11 mm long, lanceolate, linear-oblong, or oblanceolate, thinnish, and distantly serrate
..... L. annotinum ssp. annotinum
1. Leaves of fruiting branches 2.5-6 mm long, linear or lance-attenuate, thick, entire, and dorsally convex
..... L. annotinum ssp. pungens



Lycopodium annotinum ssp. *pungens*
[From Clute (1905), plate facing p. 88.]

Lycopodium clavatum L. Staghorn Clubmoss.

Meaning of Species Name. Club-shaped.

Other Names. Common Clubmoss, Running Clubmoss, Running Moss, Coral Clubmoss, Staghorn-evergreen, Buckhorn, Wolf's-claw, Running-pine, Good-luck, Foxtail, Bock's-horn, Buck's-grass, Staghorn, Stag's-tail, Lamb's-tails, Creeping-bur, Creeping Jenny, Coral-evergreen, Trailing Christmas Green, Toad-tail, Mat-grass, Clubfoot Moss, Hog's-bed, Vegetable Sulphur Moss, Festoon Pine, Bear's-bed.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Dry open woods, thickets, clearings, and rocky places in acid soil.

Range. Nf to Yuk and Ak, s to Del, Pa, mts of NC, O, Mich, Wis, Minn, Mont, Id, and Ore; also in Eurasia.

Distr in NYS. Common in most secs of the state.

Distr in the Torrey Range. Throughout the range except the pine barrens and the reg e and s of them, increasing northw.

Time of Fr. Jul-Sep; Aug 15-Sep at Cornell.
Origin. Native.

This is one of the most widely distributed of the clubmosses. In Sweden the stems are woven into doormats. The spores of this and other species are very inflammable and were formerly much used as flash powders in photography and for stage effects, such as imitating the flash of lightning in theatrical performances. The lycopodium powder used in medicine is composed of the extremely fine, very light, delicate yellow spores of this species, the supply coming mostly from Sweden, Germany, Russia, and Switzerland. It is obtained by gathering the spikes just before the spores are shed and the powder shaken out and separated by a sieve. Sometimes the spores of L. annotinum, L. complanatum, and L. selago are also gathered. Frequently these spores are adulterated with such substances as slightly roasted and colored starch, dextrin, and various pollens.

This plant is one of those once much in demand for holiday decorations, a demand that resulted in the stripping of whole areas, thus making it rare in many localities. Fortunately, owing to its manner of rooting, the whole plant was seldom pulled up and the fragments left behind may ultimately produce thrifty plants, so that it is likely to be a long time before it entirely disappears from a locality.

Medicinally, the plant is antiseptic, diuretic, demulcent, haemostatic, and emmenagogue; the part of the plant now mainly employed, however, is the minute spores which form a yellow powder. Under the names of Musculus terrestris or M. clavatus the whole plant was used, dried, by ancient physicians as a stomachic, diuretic, and antispasmodic, mainly in calculous and other kidney complaints; the spores do not appear to have been used alone until the 17th century, when they were employed as a diuretic in dropsy; a drastic in diarrhea, dysentery, and suppression of urine; a nervine in spasms and hydrophobia; an aperient in gout and scurvy; and a corroborant in rheumatism. Externally they were largely used as a dusting powder for various skin diseases, and in excoriations of infants, to prevent chafing and also as an application to wounds. It was, however, more used on the continent than in Great Britain, but English druggists included this powder in their list of drugs before 1692, although it has never had a place in the London pharmacopeia. In the form of a decoction, the plant has been employed in the treatment of rheumatism, epilepsy, and complaints of the lungs and kidneys. In the United States it has been prescribed for irritability of the bladder, in the form of a tincture, which was first made official in the U.S. Pharmacopoeia of 1860. The spores were official in the U.S. Pharmacopoeia, 1863-1947, and in the National Formulary, 1947-60, when they were used to absorb fluids from injured tissues and as a dusting powder to protect tender surfaces.

Some tribes of American Indians also made use of the styptic and coagulant properties of this species. The yellowish spores from the fruiting spikes of the Staghorn Clubmoss (and probably others) were dusted on wounds or inhaled to stop nosebleed by the Blackfeet and Potawatomi tribes.



Lycopodium clavatum--Staghorn Clubmoss
[From Clute (1905), plate facing p. 82.]

The spores are still medicinally employed by herbalists in Great Britain, primarily as a dusting powder in various skin diseases such as eczema and erysipelas and for excoriated surfaces, especially as a dusting powder to prevent chafing in infants. In pharmacy they form the best powder for coating pills to prevent their sticking to one another when placed in a closed container as well as to disguise their taste. They have such a strong repulsive power that, if the hand is powdered with them, it can be dipped in water without becoming wet.

Puri (1970) reported that in India this drug has been used internally with good results in urinary disorders, such as the spasmodic retention of urine, catarrhal cystitis, and chronic kidney diseases causing pain in the kidney, ureter, and bladder. It is also used in dyspepsia, catarrhal gastritis, and as a general and gastric sedative. The plant was also given to stop hemorrhage after childbirth. In the form of a tincture it has been prescribed for rheumatism, epilepsy, and pulmonary disorders.

The powder has side effects, however, as Whitebread has quoted instances where it has acted as a foreign body and has given rise to an indolent chronic post-operative inflammatory reaction. The alkaloids of this drug have been found harmful to warm-blooded animals, so that by the middle of the 19th century internal use of this plant had fallen into discredit; a variety of reactions, such as pressor effects, stimulation and contraction of the uterus, and paralysis, were attributed to these alkaloids.

Lycopodium complanatum L. ssp. flabelliforme (Fern.) Clausen. Trailing Ground-pine.

Meaning of Species Name. Flattened; ssp. name, fan-shaped.

Other Names. Running Evergreen, Trailing Evergreen, Ground-pine, Ground-cedar, Christmas Green, Creeping Jenny, Trailing Christmas-green, Festoon-pine, Crow-foot, Hog-bed, Running-pine, Festoon Ground-pine, Liberty, Liberty-bed, Princess Pine, Running-cedar.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Dry woods, clearings, and rocky slopes in acid soil.

Range. Que and Nf to Minn, s to Ga, Tenn, and Ia.

Distr in NYS. Common or frequent; rare on the coastal plain.

Distr in the Torrey Range. Throughout the range except in the pine barrens.

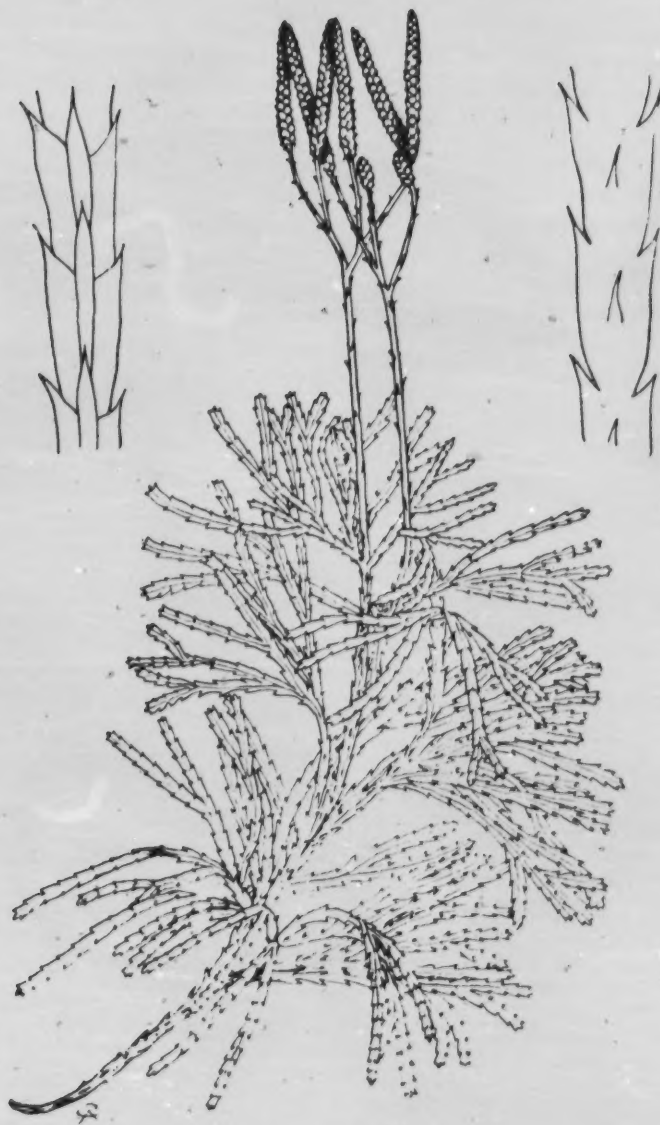
Time of Fr. Sep-Oct at Cornell.

Origin. Native.

The spores of this species and those of L. clavatum (and no doubt those of other species as well), once furnished the flammable powder known as lycopodium powder or vegetable sulphur used for stage effects and other commercial applications.

This species has often been used in great quantities for decorations. It is said that the trade in Christmas greens began in New Jersey with this plant more than a century ago. Until quite recently that state was still prominent in the business, though the demand long ago became so great that other sources of supply had to be found. As a consequence of the annual raids made upon it, this plant is rapidly becoming rare in many places, but it still carpets the ground in some remote areas. Because of its use in decorations, it is probably oftener seen than any other species of this genus.

The whole plant was once employed medicinally, dried and powdered for use in infusion. It is a powerful diuretic, promoting urine flow and removing obstructions of the liver and spleen. It was therefore once considered a valuable remedy in jaundice, rheumatism, and most of the chronic diseases. A decoction of this plant, combined with Dandelion and Agrimony, was once a highly recommended herbal remedy for liver complaints. The Flambeau Ojibwas used the dried leaves of this plant as a reviver.



Lycopodium complanatum ssp. *flabelliforme*--Trailing Ground-pine
[From Billington (1952), Fig. 20, p. 108.]



Lycopodium inundatum--Bog Clubmoss
[From Clute (1905), plate facing p. 114.]

Lycopodium inundatum L. Bog Clubmoss.

Meaning of Species Name. Inundated.

Other Names. Marsh Clubmoss.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Swamps, bogs, and wet sandy banks in acid soil.

Range. Nf to Ak, s to NJ, Pa, mts to Va and WVa, O, Ind, Ill, Minn, Id, and Ore; also in Eurasia.

Distr in NYS. Essex, Hamilton, Herkimer, St Lawrence, Lewis, and Oswego co, s to Onondaga, Madison, Oneida, Saratoga, Albany, Rensselaer, Columbia, and Tioga co; not reported from w of Onondaga co nor (in 1924) from the Catskill mts or s of the Hudson highlands.

Distr in the Torrey Range. Ct, NJ, and Pa only; no distr given for NY in Taylor (1915).

Elevation. Collected at 1400 ft in Delaware co.

Time of Fr. Jul-Oct; Jul-Aug at Cornell.

Origin. Native.

The stems of this species are slender and threadlike, from 2 to 8 inches long, and are rooted near the base, beyond which they often rise clear of the earth, often bending over in the form of an arch to root again at the tip. The plant is therefore truly a walking clubmoss. In the smaller specimens the stems commonly do not branch, but in the larger ones two or three short branches may be produced, each of which roots at the tip like the main stem. This is their only means of continuing existence, for at the end of the growing season the older parts of the plant die, leaving these vigorous, budlike tips, filled with plant food, as so many points from which new stems may be produced the following year.

The Bog Clubmoss is a northern plant that is considered rather rare in the United States. It is the smallest species to be found in the Catskills; fruiting specimens are sometimes less than 2 inches long.

Lycopodium lucidulum Michx. Shining Clubmoss.

Meaning of Species Name. Somewhat shining.

Other Names. Trailing Evergreen, Moonfruit-pine, Hemlock Clubmoss, Swamp Evergreen, Staghorn-moss.

Type of Plant. A perennial herb, reproducing by spores and gemmae (a budlike reproductive body).

Habitat. Cool woods and rocky places in acid soil.

Range. Nf to Ont and Minn, s to SC, Tenn, Ind, Ill, and Mo; also in Asia.

Distr in NYS. Common northw, frequent in the w part of the state, and local or rare southw to Dutchess, Ulster, Greene, and Delaware co, and near Baldwin, LI.

Distr in the Torrey Range. NY; Dutchess, Ulster, Greene, and Delaware co, and near Baldwin, LI.

Elevation. Grows to nearly 5700 ft in Va; sea level-3365 ft in the Torrey range; observed at the summit of Slide Mt (4100 ft) in Ulster co.

Time of Fr. Jul-Sep; Aug-Sep at Cornell.

Origin. Native.

Growth in this species proceeds very slowly, often not more than an inch a year. This species, according to Clute (1905), also produces numerous small bulblets that are capable of forming new plants. In addition, by division of the forking stem and decay of the prostrate parts, a single plant may ultimately give rise to a whole colony. Most of the clubmosses are very difficult to transplant, but this species takes readily to cultivation if put in congenial surroundings.

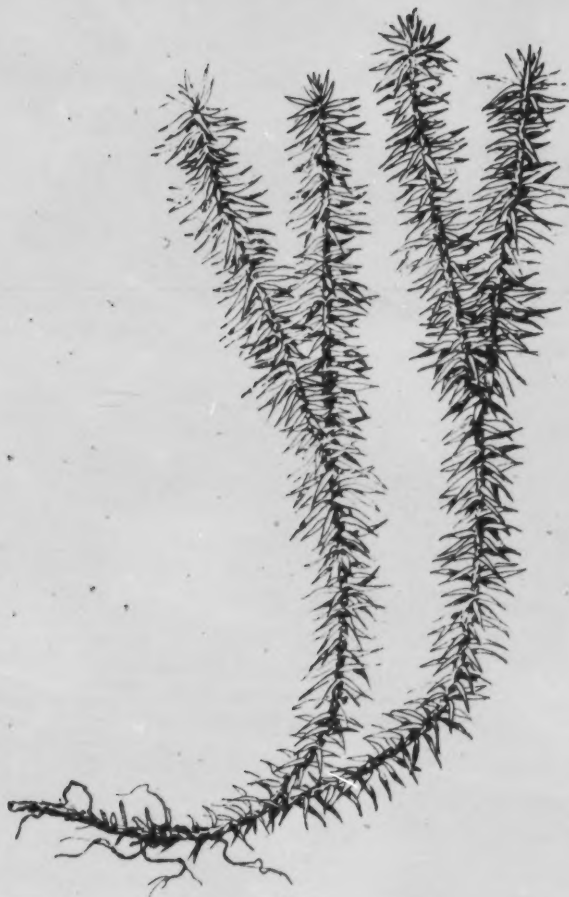
Lycopodium obscurum L. Tree Clubmoss.

Meaning of Species Name. Obscure; application unexplained, except that Linnaeus stated that the fruit was unknown to him.

Other Names. Flat-branched Ground-pine, Ground-pine, Bunch Evergreen, Spiral-pine, Treelike Clubmoss, Crowfoot, Prince's-pine.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Woods, copses, clearings, and bog margins in acid soil.



Lycopodium lucidulum--Shining Clubmoss
[From Clute (1905), plate facing p. 108.]

Range. Lab and Nf to Ak, s to NC, Ga, Tenn, Ala, Ind, Minn, SD, Mont, and Wash; also in Asia.

Distr in NYS. Common in most secs of the state n of the coastal plain.

Distr in the Torrey Range. Common throughout the range except in the pine barrens; there rare.

Elevation. Grows to 4000 ft in Va; observed above 3000 ft in Delaware co.

Time of Fr. Jul-Nov; Sep-Nov at Cornell.

Origin. Native.

The upright stems of this species so much resemble miniature pine trees that anyone finding the plant for the first time is likely to identify it by associating its appearance with the idea suggested by the common name of Tree Clubmoss. This is another of the species once widely used for holiday decorations.

The Potawatomis employed the spores of this species for their styptic and coagulant properties. The Montagnais boiled the whole plant and drank the decoction as a purgative in cases of biliousness; as such, it is said to have been very effective. Among the Chippewas a decoction of this species, together with twigs of Picea glauca and chips from the heartwood of Ostrya virginiana, was made for use in steaming stiff joints. It is also thought that this species was of some medicinal value to the Penobscots. Some Indians are said to have gathered this species for sale to whites, who used the spores.



Lycopodium obscurum--Tree Clubmoss
[From Clute (1905), plate facing p. 102.]



Lycopodium sabinaefolium--Savin-leaved Clubmoss
[From Clute (1905), plate facing p. 96.]

Lycopodium sabinaefolium Willd. Savin-leaved Clubmoss.

Meaning of Species Name. Savin-leaved.

Other Names. Heath-cypress, Cedar-like Clubmoss, Ground Fir, Ground Savin.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Usually found in subalpine woods, thickets, and clearings, but sometimes on dry sterile soil.

Range. Nf and Que to Ak, s to NY, Pa, and Mich.

Distr in NYS. In 1924 known only from Herkimer co.

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Mid-Jul-Sep.

Origin. Native.



Lycopodium selago--Fir Clubmoss
[From Clute (1905), plate facing p. 112.]

Lycopodium selago L. Fir Clubmoss.

Meaning of Species Name. An old name for the group.

Other Names. Mountain-clubmoss, Upright Clubmoss, Fir-moss, Tree-moss, Foxfeet, Dwarf Staghorn-moss, Ground Fir.

Type of Plant. A perennial herb, reproducing by spores and gemmae (budlike reproductive bodies).

Habitat. Mossy rocks, cold woods, barrens, and bare mountains.

Range. Gl, Baffinland, and Nf to Yuk and Ak, s to NY, mts of Va and NC, Mich, Wis, Mont, and Ore; also in Eurasia, Mex, and SAm.

Distr in NYS. In 1924 House gave its distr as mt summits of n NY; rare.

Distr in the Torrey Range. In 1915 known only from Pike co, Pa.

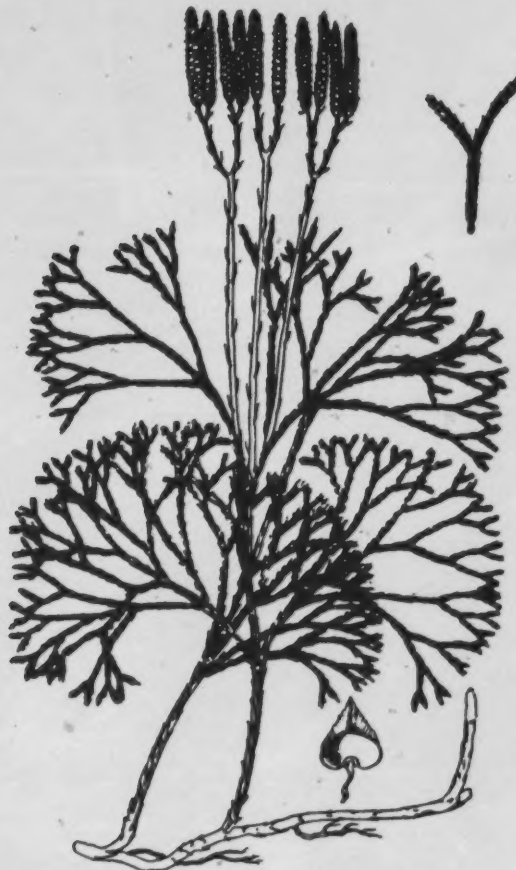
Time of Fr. Jul-Sep.

Origin. Native.

Remarks. In the US this species is a rare plant of high mountain summits.

This species was once valued for its medicinal qualities, particularly by the druids, who used it as an emetic and cathartic. It was also occasionally used in much later times, but it is too powerful a drug to be safe. An ointment made from it was employed as a counterirritant, and a decoction of the stems is said to be used in Sweden to destroy vermin on cattle. Like others, this plant has been used for dyeing and for fixing the color of woollen goods. Indians of the northwestern United States and the natives of Alaska used the stems of this plant to produce

a kind of intoxication. By chewing the stems of three plants, a mild intoxication was experienced; chewing those of eight plants was said to render the individual unconscious.



Lycopodium tristachyum--Ground-cedar
[From Small (1935), p. 227.]

Lycopodium tristachyum Pursh. Ground-cedar.

Meaning of Species Name. Three-spiked, from the usual habit of the fruiting spikes.

Other Names. Ground-pine, Ground-fir, Ground-cypress.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Acid woods, thickets, and clearings.

Range. Nf and Que to Alta, s to NC, Tenn, Ala, Mich, and Minn; also in Eu.

Distr in NYS. Locally abundant across the state northw, s to Ulster co and w to Schuyler co; doubtless locally elsewhere westw; reported from LI.

Distr in the Torrey Range. Throughout the range except the coastal plain of NJ, there rare.

Time of Fr. Jun-Sep; Aug at Cornell.

Origin. Native.

Remarks. As noted by Steyermark (1963), L. tristachyum differs from L. complanatum in the well-developed ventral leaves, the bluish color of the sterile branchlets, and the many constrictions along the branchlets.

SELAGINELLALES

This order is similar to the Lycopodiales in many respects, but the relationship is perhaps not so close as was once believed, since there is ample evidence to indicate that members of the Selaginallales are more advanced than those of the Lycopodiales. Members of this order are readily distinguished from the Lycopodiales by the presence of a ligule and heterosporous strobili.

SELAGINELLACEAE, the Selaginella Family

This family contains only one genus, Selaginella, of which there are some 500 species of wide geographical distribution, but these are mostly tropical. Most species are found in tropical America and Asia, but some 37 species occur in the United States. They are small, perennial, evergreen terrestrial plants resembling mosses or liverworts.

Selaginella Beauv. Selaginella.

The name of this genus is a diminutive of Selago, an ancient name of Lycopodium, which some of these plants greatly resemble in habit and foliage. Selaginellas from the warmer parts of the world are often characterized by a delicacy in form and color that causes them to be in great demand for cultivation in conservatories. Some 25 species of Selaginella, several of which are climbing plants, are cultivated domestically as ornamentals. They are used for a variety of purposes, such as for decorating terrariums, for edging greenhouse benches, carpeting the ground under the benches, furnishing hanging baskets, and draping pillars. The widely publicized Resurrection Plant (S. lepidophylla) is shipped by the bale from Mexico for sale in the United States as a novelty. It is so called because of its habit of curling into a tight ball and turning brown when dry, and opening out flat and becoming green again when moisture is available to it. Everett (1960) remarks that another plant sometimes called Resurrection Plant, and for the same reason, is Anastatica hierochuntica, a native of Asia Minor belonging to the Mustard family. The species of Selaginella native to the northeastern states, however, are so small and mosslike as to be easily overlooked.

These plants are reproduced by spores. The most distinctive feature of the selaginellas is found in the small scalelike leaves, which are set close together all along the stems; in many cases they are sessile and align parallel to the stems (not at right angles as in the majority of plants), so that the branches and leaves are in one flat plane. Generally they are of a light green color but in some species they are bluish and in others they have a grayish, reddish, or bronze sheen. Although these plants vary much in habit of growth, they all flourish under much the same conditions.

Because the dry plants of some species appear to become fresh and green again when put into water, physicians in India often use them as rejuvenators for the human body, according to Puri (1970). They are also

used in the treatment of mental diseases, rickets, blood vomiting, and spermatorrhoea.

Selaginella rupestris (L.) Spring. Spike-moss.

Meaning of Species Name. Of rocks.

Other Names. Rock Selaginella, Festoon-pine, Dwarf Clubmoss, Christmas Evergreen, Resurrection Plant.

Type of Plant. A perennial herb, reproducing by spores and quite possibly by fragmenting.

Habitat. Dry rocks or packed sand in subacid soil.

Range. Que to Minn and Man, s to Ga, Ala, Ark, and Okla; also in Eurasia.

Distr in NYS. "Local;" as given by House (1924).

Distr in the Torrey Range. Scattered throughout the range except the NJ coastal plain and LI, there not reported.

Elevation. Grows to 2000 ft in Va.

Time of Fr. Jul-Oct; Sep-Oct at Cornell.

Origin. Native.

Remarks. Grayish-green, suggesting a rigid moss.

Since these plants are subjected to long spells of summer heat and drought on the exposed sites where they grow, at such times they appear dry, brittle, and lifeless. They respond to the slightest moisture, however, and become soft, dull green, and lifelike again after a rain.



Selaginella rupestris--Spike-moss
[From Billington (1952), Fig. 24, p. 116.]

ISOËTALES

This order is related to the Selaginellales by the presence of a ligule and the existence of a heterosporous condition and to the Lycopodiales in anatomical features of both stem and leaves. Among other characteristics, it differs from both orders, however, by the general habit of the plants, the root system, and in morphology of the stem.

This order contains only one family, the Isoëtaceae. Isoëtes, the only genus in this family, is the only extant remnant of a once dominant component of the earth's flora. Some botanists feel that this genus is perhaps a relic or derivative of the Pleuromeiales, a dominant group of Carboniferous plants that persisted into the Triassic, rather than having been derived from known ancestral stocks of either Lycopodiales or Selaginellales.

ISOËTACEAE, the Quillwort Family

Lawrence (1951) states that this family contains a single genus, Isoëtes. These mostly aquatic perennial herbs with fleshy cormlike axes and linear grasslike leaves comprise an isolated group of plants not closely connected with any other living forms. A Quillwort is essentially a rosette of short, hollow, cylindrical, pointed leaves with sporangia in their axils. The species are so similar in habit and aspect that they are often difficult to identify. Of the 50 or more species of Isoëtes, a large number grow on the bottoms of lakes, ponds, and slow-moving streams at depths of from 1 to 25 feet below the surface of the water; others, however, are more rarely if ever submerged, although they always grow in wet places.

In Isoëtes there is a sluggish secondary growth in the short stock, which itself shows certain analogies with the stigmarian trunks of gigantic fossils. Since any of the leaves of Isoëtes may be fertile, the whole plant appears as a strobilus of the same nature as Lepidostrobus, seated upon a stigmarian base. In face, Isoëtes is like a telescoped, but still living, fossil.

Isoëtes L. Quillwort.

There are from 60 to 80 species of Isoëtes distributed throughout the world, but most numerous in the north temperate zone. Some 20 species occur in the United States, 7 of which grow in the northeastern states and adjacent Canada. The species are difficult to distinguish even with the aid of a compound microscope. None of the species is of significant economic importance. The name of the genus is said to be derived from two Greek words meaning "equal" and "year," referring to the perennial character of the leaves.

They are tufted herbs, mostly living at the bottom of fresh-water lakes, though a few are amphibious or terrestrial. A plant consists of a short, lobed stock, bearing crowded awl-shaped leaves of considerable

length. Each bears a ligule on its upper surface, and, when fertile (as any one of them may be), a large sporangium lies between this and the axis. Roots with dichotomous branching arise from furrows between lobes of the stem. The crisp bulbs of some species are favorite morsels of muskrats, and cattle are said to feed upon the leaves of any species that is accessible.

Isöetes macrospora Dur. Lake Quillwort.

Meaning of Species Name. Large-spored.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Margins and shores of fresh pools, lakes, and streams, ascending to alpine ponds.

Range. Nf to Minn, s to Mass, Catskill mts of NY, Mich, and Wis.

Distr in NYS. House (1924) states that it is rare, but it is locally common in some areas and doubtless generally overlooked elsewhere.

Distr in the Torrey Range. "Lake in the Catskills"; not since recorded with certainty in our area.

Origin. Native.

In Europe the fleshy corms of a related species (I. lacustris) have occasionally been eaten but are said to have an earthy taste that is scarcely palatable. Fish are also said to be fond of the tender leaves.



Isöetes macrospora--Lake Quillwort
[From Billington (1952), Fig. 25, p. 118.]

THE FERNS

The ferns constitute a fascinating group of plants in which many people are interested, but the more or less technical keys to the various genera and species sometimes make it difficult for the amateur to identify the species that he may encounter in the field. It is hoped that the following key to most of the species occurring in the Catskills, adapted from Montgomery (1978) and based chiefly on vegetative characters, will facilitate work on this group of plants, particularly if used in conjunction with the keys and illustrations that follow.

A Vegetative Key to the Ferns of the Catskills

1. Blades simple, not cut into separate pinnae, 2
 2. Blade entire (vegetative blades flat and leaflike; plants of woods, open fields, or rocks), 3
 3. Blade oval, tapering to the stipe..... Ophioglossum vulgatum
 3. Blade lanceolate, cordate at the base (veins areolate; blade often rooting at the tip)..... Asplenium rhizophyllum
 2. Blades pinnatifid, 4
 4. Veins areolate (lobes opposite or nearly so, entire or wavy-margined; basal lobes the longest)..... Onoclea sensibilis
 4. Veins free, 5
 5. Segments again pinnatifid; primary segments connected by a wing along rachis..... Thelypteris hexagonoptera
 5. Segments toothed to entire (blades and upper stipes without scales; usually growing on rocks, trees, or thin soil)..... Polypodium vulgare
1. Blades at least once pinnate (cut into separate pinnae), 6
 6. Blades with entire to serrate pinnae, 7
 7. Pinnae auriculate, 8
 8. Stipe smooth and shining; blade thin-textured; stipe bundle one..... Asplenium platyneuron
 8. Stipe scaly; fronds thick-textured and evergreen; stipe with several bundles in cross-section (stipe 1/3 to 1/2 as long as the blades; lower pinnae not much reduced)..... Polystichum acrostichoides
 7. Pinnae not auriculate, 9
 9. Blade and especially stipe fleshy in texture; fertile segment of blade very different from the vegetative in appearance, and nearly always present..... Botrychium
 9. Blade and stipe not particularly thick or fleshy; fertile part of frond, when present, much like the vegetative part, 10
 10. Pinnae elongate, entire (pinnae thin-textured, acuminate; stipe green)..... Athyrium pycnocarpon
 10. Pinnae nearly orbicular, blunt, serrate (stipe and rachis dark brown)..... Asplenium trichomanes
 6. Blades with pinnae pinnatifid to pinnate (or more), 11
 11. Blades palmately branched (stipe forked at summit)..... Adiantum pedatum

11. Blades pinnately branched, 12
 12. Blades elongate, climbing; pinnae 2-forked, then palmately lobed..... Lygodium palmatum
 12. Blades not elongate and climbing; pinnae not as above, 13
 13. Frond ternate; i.e., the two lowest pinnae much larger than the next above, and stalked, so that the blade appears to be made up of three nearly equal divisions, 14
 14. Fronds 0.5 m tall or more; coarse.... Pteridium aquilinum
 14. Fronds less than 0.5 m tall, delicate, 15
 15. Stipe sparsely scaly..... Gymnocarpium dryopteris
 15. Stipe glabrous, 16
 16. Frond herbaceous, deciduous, finely divided..... Botrychium virginianum
 16. Frond leathery, evergreen or nearly so Botrychium
 13. Frond not ternate, 17
 17. Pinnae reduced to small wings at base of blade (the blade tapering at both ends), 18
 18. Stipe dark brown, thick; fronds clustered; blade glabrous..... Matteuccia struthiopteris
 18. Stipe green, thin; fronds scattered; blades pubescent..... Thelypteris noveboracensis
 17. Pinnae not reduced to small wings below (veins all free), 19
 19. Middle pinnae connected by a wing along the main rachis; pinnae pinnatifid, 20
 20. Lowest pinna-pair free; lower blade surface pubescent and scaly..... Thelypteris phegopteris
 20. All pinnae united by wings; lower blade surface sparsely pubescent, not scaly..... Thelypteris hexagonoptera
 19. Pinnae free, except at tip of blade, 21
 21. Fronds 15 cm long or less; mostly small rock ferns with tufted fronds, 22
 22. Stipes brown or purple-black throughout, 23
 23. Stipes jointed, leaving a stubble of uniform old bases (blade rusty-brown hairy below)..... Woodsia ilvensis
 23. Stipes not jointed; stubble uneven, 24
 24. Stipe cross-section with two bundles (stipe brown at base, straw-colored above).. Woodsia obtusa
 24. Cross-section of stipe with one bundle (hairs brownish on older blades)..... Cheilanthes lanosa
 22. Stipes brown only at base, 25
 25. Fronds widest at middle, narrowly elliptic in outline, only 1-2 cm broad..... Woodsia glabella
 25. Frond triangular in outline, widest near base, 2-5 cm broad (fronds spaced apart; fertile fronds very different from the sterile ones)
 - Cryptogramma stelleri

21. Fronds more than 15 cm long, 26
 26. Frond bipinnate, the divisions not pinnatifid, 27
 27. Stipe and rachis very scaly; segments spinulose
..... Polystichum braunii
 27. Stipe hairy or glabrous, but not scaly; segments
entire (fronds usually 1/2 to 1 m or more high)
..... Osmunda regalis
 26. Frond divisions pinnatifid, 28
 28. Fronds pinnate-pinnatifid, the segments or lobes of
the pinnae entire, 29
 29. Stipe bundle one, horseshoe-shaped D with incurved
edges; stipules present at base of stipe, 30
 30. Tuft of hairs in axils of mature pinnae;
pinnae subacute at tip..... Osmunda cinnamomea
 30. No tuft of hairs in axils of mature pinnae;
pinnae round-tipped..... Osmunda claytoniana
 29. Stipe bundles 2 at base of stipe, 31
 31. Veins of pinnules forking; pinnae with en-
larged basal pinnules..... Thelypteris palustris
 31. Veins of pinnules not forking; basal pin-
nules not enlarged (fronds tufted; rachis
densely hairy)..... Athyrium thelypteroides
 28. Fronds pinnate-pinnatifid or more divided, the lobes
of the pinnae toothed, lobed, or pinnate, 32
 32. Blades with the lower surface densely hairy or
scaly, the surface at least partly obscured by
the indument (both very rare ferns in the Cats-
kill region), 33
 33. Fronds aromatic glandular and scaly
..... Dryopteris fragrans
 33. Fronds not aromatic glandular, with hairs
only (hairs eventually turning brown)
..... Cheilanthes lanosa
 32. Blade surface sparsely pubescent to glabrous, 34
 34. Fronds arising singly (but growing in large
colonies); rachis finely hairy; cross-section
at base of stipe with one horseshoe-shaped
bundle..... Dennstaedtia punctilobula
 34. Fronds tufted; rachis smooth or hairy; stipe
cross-section at base of stipe with 2 or
several bundles, 35
 35. Cross-section at base of stipe with 2
bundles, 36
 36. Stipe and rachis without hairs or scales, 37
 37. Fronds lanceolate, elongated, often
with bulblets beneath upper part of
blade; stipe pinkish Cystopteris bulbifera
 37. Fronds ovate-oblong, not bulblet-
bearing; stipe green to brown (fronds
clustered; stipes red-brown; usu-
ally growing among rocks)
..... Cystopteris fragilis
 36. Stipe and rachis with hairs or scales or
both, 38

- 38. Cross-section of the stipe with 2 round bundles; fronds slender, with blades 8 cm or less broad; rock plants (axis scaly but not hairy; stipe brown at base, straw-colored above)..... Woodsia obtusa
- 38. Cross-section of stipe with 2 elongate curved bundles; fronds usually stout, 10 cm or more broad; mostly woodland plants, 39
 - 39. Blade pinnate-pinnatifid, with narrow hairlike scales..... Athyrium thelypteroides
 - 39. Blade bi- to tri-pinnate, scaleless or with a few broad scales..... Athyrium filix-femina
- 35. Cross-section at base of stipe with 5 small bundles, 40
 - 40. Blade bipinnate-pinnatifid to tripinnate below, the segments with sharp-pointed, prominent teeth, 41
 - 41. Rachis and minor axes parts glandular; fronds evergreen..... Dryopteris spinulosa ssp. intermedia
 - 41. Rachis and minor axes without glands; fronds not evergreen, 42
 - 42. Innermost bottom pinule about equal in width to the pinule opposite it on the pinna, shorter to more commonly longer than the next pinule; teeth incurved..... Dryopteris spinulosa ssp. spinulosa
 - 42. Innermost bottom pinule as broad as 2 pinnules above it on the pinna, usually much longer than the pinule adjacent; teeth spreading
..... Dryopteris spinulosa ssp. dilatata
 - 40. Blade pinnate-pinnatifid to bipinnate only at base; the segments with rounded or somewhat acute teeth or entire, 43
 - 43. Blade thickish in texture, evergreen; scales at base of stipe in a dense tuft, light brown.. Dryopteris marginalis
 - 43. Blade normal in texture, eventually deciduous; scales at base of blade dark, or, if light, then scaly throughout, 44
 - 44. Lowest pinnae-pair ovate, narrowed at base; scales of stipe dark brown (frond abruptly narrowed at tip)..... Dryopteris goldiana
 - 44. Lowest pinnae-pair triangular, broadest at base; scales light brown, 45
 - 45. Pinnae turned at right angles to plane of frond (like venetian blind slats); fronds quite narrow; typically a few very small evergreen fronds at base of plant Dryopteris cristata
 - 45. Pinnae usually not twisted out of plane of blade; fronds not as narrow, but more variable; small evergreen fronds present or absent..... Dryopteris clintoniana

OPHIOGLOSSALES

This order contains a single family of mostly terrestrial (sometimes epiphytic) herbs; the sporangia are without annulae, bivalvate, and dehisce by slits. The ferns of this order are conceded to be among the most primitive of the ferns, but the three living genera are rather highly specialized, with evidence of specialization lying in features of reduction and simplification from more complex relatives and ancestors.

OPHIOGLOSSACEAE, the Adder's-tongue Family

This family comprises 3 genera and from 50 to 60 species, widely distributed throughout the world except in desert regions. They are perennial, scaleless, typically glabrous, soft and fleshy, terrestrial herbs. The plants usually prefer acid soils and are often found in moist, open or shaded situations, where they are frequently overlooked because of their small size.

Key to Local Genera

1. Sterile leaf blades entire, ovate to elliptic, oblong; sporangia fused together in a simple spike; veins reticulated Ophioglossum
1. Sterile leaf blades variously lobed, pinnate, or decompound; sporangia free, separate, short-stalked, in loose or compact panicles; veins free, forked Botrychium

Botrychium Sw. Grape Fern.

This is an essentially cosmopolitan genus of about 23 species. They are perennial herbs, the sterile blades sessile or stalked, fleshy, and mostly pinnately or subpalmately compound. The name of the genus is derived from the Greek botrys, a cluster of grapes, from the appearance of the fruiting cluster, whence also the common name Grape Fern. Each plant typically produces one frond apparently forked into one sterile leafy portion and one spore-bearing fertile portion.

Key to Local Species of Botrychium

1. Plants large, often 30-60 cm high; sterile part of frond thin and membranaceous, sessile at about the middle of the plant; base of the stalk (covering the bud) opening along one side B. virginianum
1. Plants smaller, 5-25 (rarely 40) cm high; sterile part of frond usually somewhat fleshy; bud completely enclosed by base of stalk, 2
2. Sterile blades slightly pilose, at least in bud, ternately decompound, mostly on a long petiole (chiefly 1-17 cm long) from near base of plant; the margin (seen under magnification) whitish; some or all blades overwintering; spores ripe in late summer or autumn, 3

3. Ultimate segments lanceolate to lance-ovate, acute or acutish, the chief terminal ones prolonged; sterile blades becoming bronze or purplish in autumn: spores shed from mid-September into November..... B. dissectum
3. Ultimate segments of sterile blade ovate, obovate, rhombic, or rounded, with blunt or rounded tips, the chief terminal ones not greatly prolonged; sterile blades remaining green all winter; spores ripening Jul-Nov, 4
4. Lateral pinnules elongate, 2-3 times longer than wide (stalk of sterile blade 5-15 cm long, the blade mostly 6-12 cm long and 9-16 cm wide, bipinnate to tripinnate, the pinnules not imbricate, obviously dentate; fruiting August-November..... B. x oneidense
4. Lateral pinnules shorter, less than twice as long as wide; fruiting July-October, 5
5. Stalk of sterile blade 1-4 cm long; blades mostly 3-5 cm long and wide, bipinnate to tripinnate; pinnules crowded, often imbricate, mostly ovate, subentire to crenate..... B. multifidum ssp. multifidum
5. Stalk of sterile blade mostly 3-8 cm long; blade normally 6-11 cm long and 9-20 cm wide, tripinnate to quadripinnatifid; pinnules not imbricate, mostly less than twice as long as wide, subentire to dentate..... B. multifidum ssp. silvaifolium
2. Sterile blade pinnate or pinnatifid, borne high above the base, glabrous even in bud; if ternate and subbasal, with petiole less than 1 cm long; margin not white (as seen through lens); fronds soft and shriveling in summer or autumn, not evergreen; spores ripening in spring or summer, 6
6. Sterile blade simple to ternate, rarely pinnatifid, basal or subbasal..... B. simplex
6. Sterile blade pinnate or pinnatifid, not ternate, borne from above middle to summit of plant, 7
7. Sterile blade deltoid, sessile at base of fruiting panicle, its segments lanceolate, acute; expanding basal bud with both fertile and sterile blades abruptly reflexed B. lanceolatum
7. Sterile blade oblong to ovate, with oblong, oblong-ovate, or narrowly obovate segments; sterile blade sessile or very short-petioled, borne from above middle to summit of plant, pinnate or bipinnatifid; the expanding basal bud with both sterile and fertile blades erect, ascending or divergent, not both reflexed..... B. matricariaefolium

Botrychium dissectum Spreng. Cut-leaved Grape Fern.

Meaning of Species Name. Dissected, from the outline of the sterile blade.

Other Names. Dissected Grape Fern, Cut-leaved Moonwort.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Pastures, clearings, old fields, open thickets, sandy banks, sterile meadows, low thickets, and open shaded soil.

Range. NS to Minn, s to Ga, Ala, La, Okla, Mo, and e Tex.

Distr in NYS. Frequent.



Botrychium dissectum var. *dissectum*
[From Small (1935), p. 171.]



Botrychium dissectum var. *obliquum*
[From Small (1935), p. 169.]

Cut-leaved Grape Fern

Distr in the Torrey Range. Throughout the range; less common in the pine barrens than elsewhere.

Time of Fr. Mid-Sep-Nov; Aug-15-Sep at Cornell.

Origin. Native.

This is the latest of the botrychiums to appear. It takes kindly to cultivation if taken up with plenty of soil and left to itself after replanting. In the field two varieties are often found growing side by side; the differences in appearance of the extremes are striking enough to lead the novice to suspect that two separate species are involved. Variety dissectum has the divisions of the blade deeply and finely lacerated or divided, the segments mostly acute; in var. obliquum the divisions are entire to serrulate or even lobed, but not finely lacerated or divided. These differences are well illustrated in the accompanying illustrations.

Botrychium lanceolatum (Gmel.) Rupr. ssp. angustisegmentum (Pease & Moore) Clausen. Lance-leaved Grape Fern.

Meaning of Species Name. Lanceolate; ssp. name, with narrow segments.

Other Names. Triangle Grape Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist shady woodlands, openings, meadows, and margins of swamps.

Range. Nf to Wis, s to NJ, Va, Pa, WVa, and O.

Distr in NYS. Infrequent and local.

Distr in the Torrey Range. NY: Westchester and Rockland co, increasing ... northw.

Time of Fr. Jun-Jul; Jul at Cornell.

Origin. Native.

Botrychium matricariaefolium A. Br. Matricary Grape Fern.

Meaning of Species Name. With leaves of Matricaria (Feverwort).

Other Names. Wood's Grape Fern, Meriden Botrychium.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Woods, thickets, and dry to moist old fields in sub-acid soil.

Range. Lab and Nf to s BC, s to Md, Va, WVa, O, Mich, Wis, SD, and Id; also in Eurasia.

Distr in NYS. Common across the state northw, chiefly outside the Adirondacks, but not definitely known from LI.

Distr in the Torrey Range. NY: Reported but not definitely known from LI, otherwise known only from n Westchester co northw.

Time of Fr. Jun-Jul(Aug); Jun 15-Jul at Cornell.

Origin. Native.

This species fruits nearly a month earlier than B. lanceolatum, its spores often ripening by the middle of June.



Botrychium lanceolatum ssp. *angustisegmentum*
Lance-leaved Grape Fern
[From Small (1935), p. 163.]



Botrychium matricariaefolium
Matricary Grape Fern
[From Small (1935), p. 165.]



Botrychium multifidum ssp. *multifidum*--Leathery Grape Fern
[From Small (1935), p. 173.]

Botrychium multifidum (Gmel.) Rupr. ssp. *multifidum*. Leathery Grape Fern.

Meaning of Species Name. Much Divided.

Other Names. Northern Grape Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Open fields, moist grassy and sandy slopes, plains, and clearings, rarely in woodlands.

Range. Nf and Que to Alta and BC, s to Mass, NY, Mich, Wis, and Minn; also in Eurasia.

Distr in NYS. Infrequent across the n part of the state, southw to Washington, Saratoga, Herkimer, Oneida, and Lewis co.

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Jul-Oct.

Origin. Native.



Botrychium multifidum ssp. silaifolium
[From Billington (1952), Fig. 27, p. 122.]

Botrychium multifidum (Gmel.) Rupr. ssp. silaifolium (Presl) Clausen.

Meaning of Species Name. Much divided; ssp. name, with leaves of Silaus (an umbellifer).

Synonyms. B. multifidum (Gmel.) Rupr. var. intermedium (D. C. Eat.) Farw. in Fernald (1950) and in Gleason (1952).

Other Names. Coarse Leathery Grape Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Open fields and woods in acid soil.

Range. NB to BC, s to Va, O, Ind, Ill, Ia, Mont, and Cal.

Distr in NYS. Infrequent or rare.

Distr in the Torrey Range. NY: Westchester, Columbia, and Greene co.

Time of Fr. Jul-Oct.

Origin. Native.



Botrychium x oneidense--Oneida Grape Fern
[From Wherry (1961), p. 227.]

Botrychium x oneidense (Gilib.) House. Oneida Grape Fern.
(B. dissectum x B. multifidum)

Meaning of Species Name. Of Oneida co, N.Y.

Synonyms. B. dissectum Spreng. f. oneidense (Gilib.) Clute in Fernald (1950); B. multifidum (Gmel.) Rupr. var. oneidense (Gilib.) Farw. in Gleason (1952).

Other Names. Blunt-lobed Grape Fern.

Type of Plant. A perennial herb.

Habitat. Moist woodlands.

Range. NB to Ont and Minn, s to NC, Va, O, and Ind.

Distr in NYS. In 1924 known only from Oneida, Madison, Albany, and Ulster co.

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Aug-Nov.

Origin. Native.

As can be noted from the synonyms listed above, there is some confusion as to the exact status of this plant. In addition, Clauson, who monographed the Ophioglossaceae in 1938, treats this taxon as a variety of B. dissectum, while another authority gives it full species status.



Botrychium simplex--Dwarf Grape Fern
[From Small (1935), p. 167.]

Botrychium simplex, E. Hitchc. Dwarf Grape Fern.

Meaning of Species Name. Simple, from the leaf outline.

Other Names. Little Grape Fern, Hitchcock's Grape Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Meadows, pastures, and slopes.

Range. Nf to BC, s to NJ, Pa, Ind, Wis, NM, and Cal; also in Eurasia.

Distr in NYS. Rare.

Distr in the Torrey Range. NY: On LI and up the Hudson valley to Dutchess co.

Time of Fr. May-Jul.

Origin. Native.

Remarks. Among the rarest of the botrychiums.

Botrychium virginianum (L.) Sw. Rattlesnake Fern.

Meaning of Species Name. Of Virginia.

Other Names. Virginia Grape Fern, Hemlock-leaved Moonwort, Virginia Moonwort.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich woods.

Range. Lab and Nf to BC, s to Fla, Ariz, and Mex; also in Eurasia.

Distr in NYS. Common.

Distr in the Torrey Range. Throughout the range except in the pine barrens, always increasing northw.

Elevation. Observed above 3000 ft in Delaware co.

Time of Fr. May-Jun; May 20-Jun at Cornell.

Origin. Native.



Botrychium virginianum--Rattlesnake Fern
[From Wherry (1961), p. 221.]

Sturtevant (1919) states that this large succulent fern is boiled and eaten as a vegetable in the Himalayas as well as in New Zealand. Densmore (1928) remarks that among the Chippewas a poultice of the fresh root was applied to snake bites. In addition, "If a snake got into the wigwam a decoction of this root was sprinkled around and the snake did not return."

Ophioglossum L. Adder's tongue.

These are hardy perennial ferns with entire, simple or sparsely lobed, sterile blades, widely dispersed in tropical and temperate regions. They are of little horticultural value but are sometimes grown in gardens as a curiosity or for botanical interest. There are about 25 species, mostly tropical. The name of the genus is derived from the Greek ophis, a serpent, and glossa, a tongue, referring to the tongue-shaped sporophyllum, the spore-bearing structure. This genus is regarded as very



Ophioglossum vulgatum--Adder's-tongue
[From Small (1935), p. 159.]

ancient, for sporangia are embedded in the tissue of the spike, this condition being regarded as a more primitive characteristic than that exhibited by the rest of the ferns.

Ophioglossum vulgatum L. Adder's-tongue

Meaning of Species Name. Common.

Other Names. Adder's-fern, Adder's-spear, Snake's-tongue, Serpent's-tongue, Adder's-spit, Christ's Spear.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Meadows, grassy swales, wet thickets, damp sands, and sterile pastures.

Range. PEI and Que to Wash, s to Del, Pa, uplands of Va, O, Ind, Ill, Neb, Ariz, and Mex; also in the old world.

Distr in NYS. Uncommon or locally abundant in most secs of the state.

Distr in the Torrey Range. Scattered throughout the range except in the pine barrens.

Time of Fr. May-Aug; Jun 15-Jul at Cornell.
Origin. Native.

Both roots and leaves have been used in medicine, this fern having long had a reputation as a vulnerary. Grieve (1967) states that a preparation of it, known as the "Green Oil of Charity," is still in request in some areas as a remedy for wounds. The older herbalists called it "a fine cooling herb." The expressed juice of the leaves, drunk either alone or with distilled water of horsetail (Equisetum arvense) was once much employed by country people in Great Britain for internal wounds and bruises, vomiting or bleeding at the mouth or nose. Johnson (1867), however, considered it of doubtful value. The expressed juice was also considered good for sore eyes. A "very ancient recipe" gives the following directions for preparing "an efficacious ointment" for wounds: "Put 2 lb. of leaves chopped very fine into 1/2 pint of oil and 1 1/2 lb. suet melted together. Boil the whole till the herb is crisp, then strain off from the leaves." The fronds were also used as the principal ingredient in "adder's-spear ointment," to make which they were boiled with unsalted butter, "For them that are with newts, or snakes or adders stung."

EUFILICALES

This is the largest and most important order of Pteridophyta, diverse in structure and cosmopolitan in distribution. They are herbaceous to arborescent and terrestrial to aquatic ferns, varying widely in size and habit. They are accepted as advanced over the more primitive genera of the Ophioglossales and Marattiales.

OSMUNDACEAE, the Royal Fern Family

This family contains 3 genera and about 20 species of terrestrial or subaquatic ferns of ordinary habit, rarely arborescent. The family is primitive among ferns. Among its distinctive characters is the peculiar sporangial dehiscence, with the annulus composed of a group of clustered cells rather than the usual intracellular ring.

Osmunda L. Cinnamon, Interrupted, and Royal Ferns.

This is a genus of some 12 species, rather widespread over tropical and temperate regions but absent from western North America. They are coarse perennial ferns with pinnate-pinnatifid or bipinnate fronds, growing in moist places. The name of the genus is of doubtful origin but by some writers is said to be derived from Osmunder, the Saxon equivalent of the god Thor. All three species of Osmunda occurring in the Catskills are sometimes cultivated in gardens for ornament. They are not difficult to transplant.

Economically Osmunda is of importance as the major source of fiber obtained from the roots and rhizomes of this genus for use in the culture of orchids and other epiphytes. The fiber comes in more or less thick "mats" and has to be chopped and cut to pieces. For small plants it should be cut rather fine. Sphagnum moss is added to it in preparing the compost for some orchids. Osmunda fiber is also called orchid-peat.

Key to Local Species of Osmunda

1. Fronds twice pinnate, fertile at the tip..... O. regalis
1. Fronds once pinnate, the pinnae deeply pinnatifid, 2
 2. Tufts of woolly hair present at base of each sterile pinna; sterile pinnae loosely fringed with hairs on margins; lobes of pinnae acutish; fertile fronds separate from the sterile, densely woolly, cinnamon-colored..... O. cinnamomea
 2. Tufts of woolly hair mostly absent at base of each sterile pinna; sterile pinnae smooth; lobes of pinnae more rounded, obtusish; fertile fronds with fertile pinnae in middle of frond with sterile pinnae above and below..... O. claytoniana

Osmunda cinnamomea L. Cinnamon Fern.

Meaning of Species Name. Cinnamon-colored, from the hue of the nearly mature fertile fronds.

Other Names. Buckhorn, Fiddleheads, Bread-root, Swamp Brake.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Swamps, streambanks, wet woods, and thickets in sub-acid soil.

Range. Lab to Minn, s to Fla, Tex, NM, and trop Am.

Distr in NYS. Common.

Distr in the Torrey Range. Common throughout the range.

Elevation. Observed above 3000 ft in Delaware co.

Time of Fr. Spring; May 20-Jun at Cornell.

Origin. Native.

Remarks. The tufts of rusty wool at the base of the pinnules will usually distinguish this species from O. claytoniana (they are not always present on mature fronds).

This species does well planted in shaded situations if provided with sufficient acid humus. An examination of the crown when the fronds are uncoiling shows that sterile and fertile fronds are borne in separate "circles" and that the fertile fronds arise from the outer circle although at maturity they are invariably surrounded by the sterile fronds. The exchange is made by a sharp bend outward at the base of the petioles of the latter.

Nestling at the crown of the rootstock are the buds for several years to come. This central portion is known as the "heart of Osmund" or occasionally as "bog onion." The buckhorns, or white, central, unexpanded fronds are crisp and tender, with a nutty flavor somewhat like raw cabbage, but likewise with an acidity overlooked by the small boy but usually detected by those who have left their boyhood behind. It can be obtained by pulling up the clump of half-developed fronds, but this operation usually destroys the plant. The young crosiers or "fiddleheads," 6-8 inches high, have been commended by some as a cooked vegetable, boiled in salted water and served like Asparagus, but they do not compare very well in flavor with those of the Ostrich Fern. The Menominee tribe of Indians boiled the young fronds of these plants and used them to thicken soups.

In areas where this species may have become an undesirable weed, it can be controlled by improved drainage, followed by plowing and clean cultivation. Mow the fronds two or three times a year in pastures. It must be pointed out, however, that this fern is protected by law in New York State, so these operations are illegal unless carried out on your own land.

Osmunda claytoniana L. Interrupted Fern.

Meaning of Species Name. Named for John Clayton, a pioneer botanist of Virginia, ?-1773.

Other Names. Clayton's Fern, Clayton's Flowering Fern.

Type of Plant. A perennial herb, reproducing by spores.



Osmunda cinnamomea--Cinnamon Fern
[From Small (1935), p. 154.]



Osmunda claytoniana--Interrupted Fern
[From Small (1935), p. 156.]



Osmunda regalis var. *spectabilis*--Royal Fern
[From Wherry (1961), p. 205.]

Habitat. Moist woods, thickets, swamp margins, and wet meadows.

Range. Nf to Ont and Minn, s to Ga, Tenn, and Ark.

Distr in NYS. Common throughout most secs of the state.

Distr in the Torrey Range. Throughout the range except in the pine barrens and e and s of them, always increasing northw.

Elevation. Grows to 5000 ft in Va, 2500 ft in the Adirondacks.

Time of Fr. Spring and early summer: May 20-Jun 20 at Cornell.

Origin. Native.

Remarks. Commonly cultivated; it does well in a shaded situation if provided with loose rich humus and subneutral or somewhat acid soil.

Osmunda regalis L. var. *spectabilis* (Willd.) Gray. Royal Fern.

Meaning of Species Name. Royal; var. name, showy.

Other Names. Flowering Fern, Royal Osmund, Bracken, Buck-thorn, Buckhorn, King Fern, King's Fern, Water Fern, Tree Fern, Snake Fern,

Ditch Fern, Bog Onion, Herb Christopher, Hartshorn-bush, Regal Fern, Locust Fern, French Bracken, Royal Moonwort, St. Christopher's Herb, Heart of Osmund, Buckthorn, Brake, Buckhorn Brake.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Low woods, peaty thickets, swamps, and swales, mostly in acid soil.

Range. Nf to Sask, s to Fla and Tex; also in trop Am.

Distr in NYS. Common.

Distr in the Torrey Range. Common throughout the range.

Time of Fr. Spring and early summer; May 20-Jun at Cornell.

Origin. Native.

Remarks. This is not a common fern in the Catskill region.

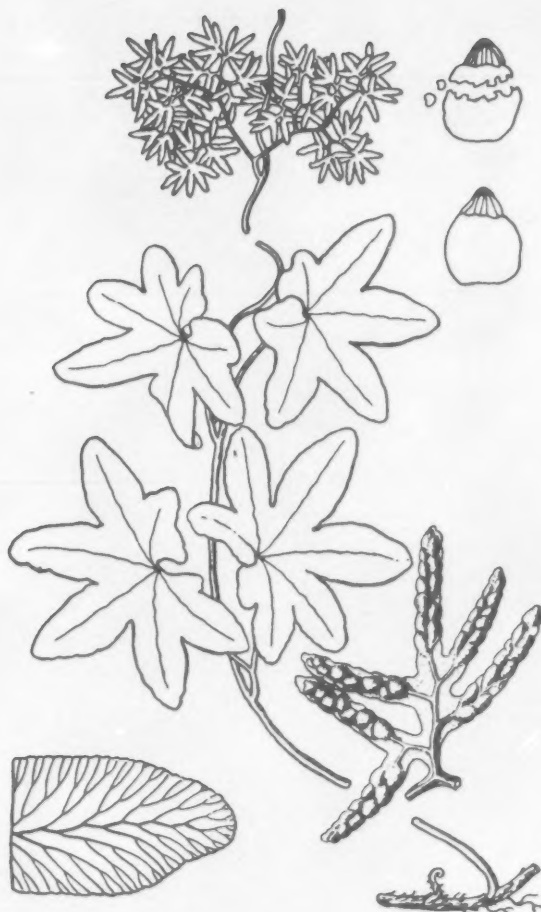
This is the only species of Osmunda common to both Europe and America. It will grow in cultivation but must be given plenty of water in order for it to produce the large fronds that constitute its chief beauty. This species is the chief source of osmunda fiber, much in demand among orchid fanciers, professional and amateur alike. The fiber is really the wiry, black root growth, which, when freed from the mud in which it grows, is an ideal medium for the potting of orchids of almost every kind.

The rhizome, which has a mucilaginous and slightly bitter taste, has been used in medicine. The actual curative virtues of Osmunda regalis have been said to be due to the salts of lime, potash, and other minerals which it derives in solution from the bog soil and from the water in which it grows. A decoction of the root has been considered of good effect in the cure of jaundice, when taken in its early stages, and for removing obstructions of the viscera. The roots have also been made into an ointment for application to wounds, bruises, and dislocations, the young fronds being thought "good to be put into balms, oyles and healing plasters." A conserve of the root was used for rickets. Gerard says: "The root and especially the heart or middle thereof, boiled or else stamped and taken with some kinde of liquor, is thought to be good for those that are wounded, dry-beaten and bruised; that have fallen from some high place."

Puri (1970) reports that in India this species is considered a tonic and styptic, prescribed in the treatment of rickets. The middle part of the plant boiled in liquid is also considered good for wounded persons, and the rootstock, macerated in water or gin until the liquor becomes a stiff mucilage, has been used to cure back pains.

SCHIZAEACEAE, the Curly-grass Family

This family contains 4 genera and about 160 species, most numerous in the American tropics, rare in temperate regions. They are terrestrial ferns of very diverse habit, some extremely small and grasslike, others climbing by leaves of indeterminate length. The genera are so markedly distinct in habit that early botanists raised each to family rank. Schizaea is offered occasionally by dealers in native plants, but it is little cultivated and then only as a novelty. Lygodium also is occasionally cultivated as an ornamental.



Lygodium palmatum--Climbing Fern
[From Small (1935), p. 148.]

Lygodium Sw. Climbing Fern.

There are about 40 species of Lygodium, mostly tropical. The name of the genus is derived from the Greek lugodes, flexuous, referring to the twining rachis. Some species of Lygodium are cultivated in subtropical regions outdoors on trellises, as they are very ornamental. In northern areas they are grown on wires fixed to pillars or the wall of the greenhouse or trained around a tripod of canes as pot plants. Plants grown in the greenhouse include L. japonicum, L. palmatum, and L. circinatum. In Ceylon and other countries hats and brooms are made of the rachis of L. scandens, a native of tropical Asia.

Lygodium palmatum (Bernh.) Sw. Climbing Fern.

Meaning of Species Name. Palmate or handlike, from the shape of the pinnules.

Other Names. Creeping Fern, Snake-tongue Fern, Windsor Fern, Hartford Fern, the last two names referring to localities in Connecticut where it was once common.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist acid soil of thickets, marshes, and open woods.

Range. S NH, Mass, and c NY to Pa, WVa, O, and Ky, s to Fla and Tenn.

Distr in NYS. Rare in Greene and Chenango co.

Distr in the Torrey Range. A rare and scattered plant; no distribution for NY given in Taylor (1915).

Elevation. Grows to 2100 ft in e Pa.

Time of Fr. Aug-Sep.

Origin. Native.

This species is mostly rare and local and is one that is much prized in ferneries as a rarity. In the late 1800's the leaves were offered for sale in autumn for decorative purposes in many southern and eastern states; the great demand for them nearly caused the plant's extinction in some areas.

POLYPODIACEAE, the Polypody Family

This is a large family of 170 genera and about 7000 species or more; it is cosmopolitan in distribution and includes most of the plants familiarly known as ferns. These have little economic value except for the approximately 225 species grown as ornamentals. They are plants of very diverse habit but rarely treelike. It is not a natural family but rather an assemblage of extraordinarily diverse ferns tied together by the attainment of certain advanced characters that have been selected as a taxonomic basis. It constitutes an aggregation of the highest members of several lines of stock and all are known as "young ferns," for no members of the family are known before the Mesozoic.

Key to Local Genera

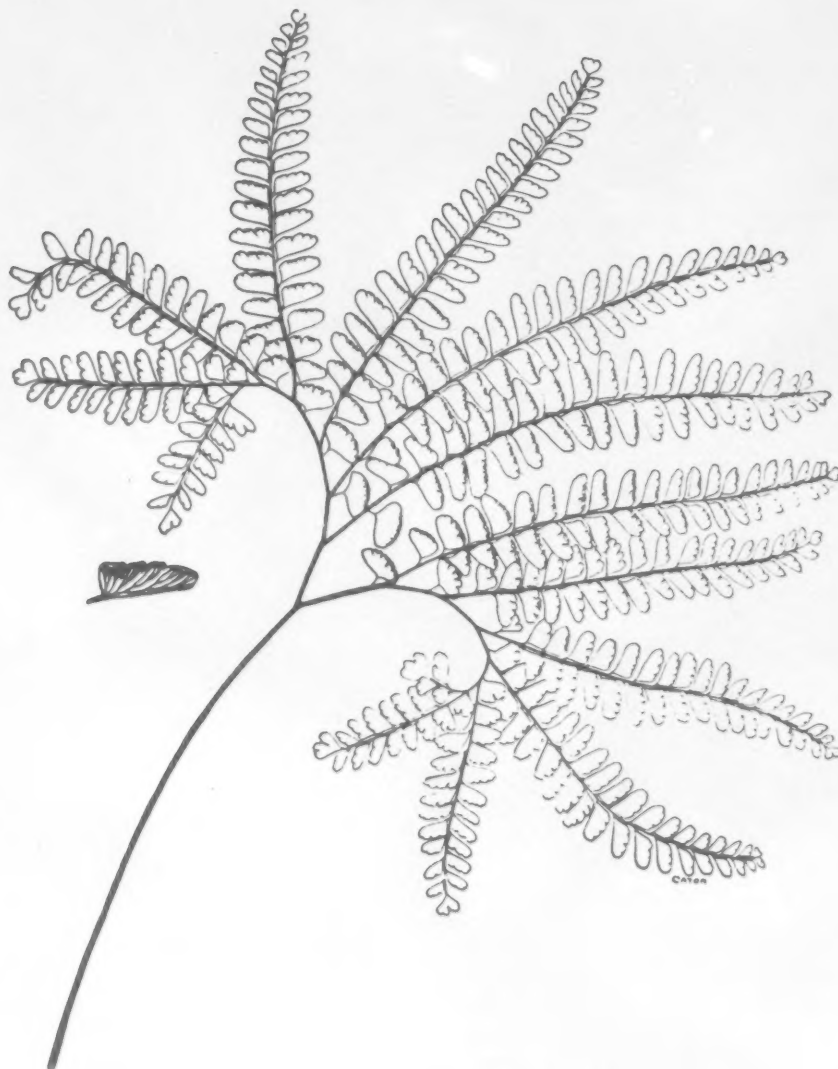
1. Fertile fronds, or portions of fronds, conspicuously unlike the sterile, the green leaf tissue of the fertile blades much reduced, 2
2. Fertile portions of fronds green and leaflike, terminal, the pinnae much narrower than the adjacent sterile ones; indusium central, attached at its middle; fronds coriaceous, evergreen..... Polystichum
2. Fertile fronds, or portions of fronds, scarcely or not at all leaflike, 3
3. Sterile fronds 1-pinnatifid, with entire margins; sterile pinnae opposite; veins netted; fertile fronds 2-pinnate, segments globose, beadlike; fronds in a row along a creeping rootstock..... Onoclea

3. Sterile fronds 2-pinnatifid; sterile pinnae alternate; veins free; fertile fronds 1-pinnate; fronds in a thick clump. Matteuccia
1. Fertile fronds, or portions of fronds, essentially like the sterile in appearance, 4
 4. Sori marginal, the indusium appearing to consist of the reflexed margin of the frond; rootstocks creeping, 5
 5. Sorus apparently continuous along the whole margin, 6
 6. Fronds very large, broadly triangular, 1-3-pinnate (ultimate segments of the blades entire)..... Pteridium
 6. Fronds small, ovate-oblong or linear-lanceolate, 7
 7. Stipes greenish except at base; fronds delicate, membranous; fertile and sterile fronds of different form..... Cryptogramma
 7. Stipes brown, hirsute (inflexed margin of the blades scarcely modified, short and mostly discontinuous; sterile and fertile pinnae alike; hirsute beneath)..... Cheilanthes
 5. Sori several or many, distinct, 8
 8. Sori subulate, borne at the tips of the fan-shaped pinnules on the veins on the under side of a reflexed marginal lobe; fronds pedate (pinnules without a distinct midvein, the small veins repeatedly forked, all about equal in size)..... Adiantum
 8. Sori as broad as long, marginal or partly covered by a reflexed tooth of the incised pinnule in addition to the true cup-shaped indusium; fronds 2-pinnate (ultimate segments of the blade incised)..... Dennstaedtia
4. Sporangia usually borne in definite sori distinctly away from the leaf margin, or, if apparently at the margins of the lobes or segments, not covered by a reflexed portion of the edge of the leaf blade, 9
 9. Young sori (and indusia when present) elongated, oblong to linear, often curved, 10
 10. Leaf blades simple, entire, narrow, long-tapering and rooting at the tips; veins netted..... Asplenium
 10. Leaf blades variously pinnate or at least deeply lobed; veins free except the lowest, the tips not anastomosing (sori more or less parallel to the oblique lateral veins of the pinnae or their lobes, sometimes curving and crossing them), 11
 11. Leaves mostly small, 5-30 cm long, evergreen (if over 30 cm, rachis shining dark brown); sori not strongly curved; indusia not crossing veins... Asplenium
 11. Leaves mostly large, 35-100 cm long, not evergreen; rachis green or sometimes reddish; sori, at least in part, strongly curved or hooked; indusia (especially the apical) often crossing veins..... Athyrium
 9. Young sori (and indusia when present) more or less circular, the sori appearing as roundish dots on the lower side of the leaf, 12
 12. Indusia superficial or wanting; fronds often evergreen, 13

13. Fronds scattered, articulated with the creeping rootstocks, 1-pinnatifid, the divisions confluent at the base; sori without indusia, prominent..... Polypodium
13. Fronds not articulate, 1-3 pinnate, if 1-pinnate, the divisions distinct; rootstocks creeping or not creeping; sori naked or covered, 14
 14. Indusia entire, peltate (attached by the middle); pinnae serrate or spinulose-toothed; fronds coriaceous, evergreen..... Polystichum
 14. Indusia cordate or absent; pinnae pinnatifid or pinnate, 15
 15. Indusia absent; rootstocks creeping; fronds easily killed by frost, 16
 16. Basal pinnae stalked; rachis of the frond not winged; blade nearly horizontal, subternate; veins simple or once forked, reaching the margin..... Gymnocarpium
 16. Basal pinnae sessile or partly adnate, the rachis more or less winged; blades suberect, not ternate..... Thelypteris
 15. Indusia present, horseshoe-shaped, orbicular, or reniform, 17
 17. Rootstocks creeping; veins simple or once forked; fronds easily killed by frost; segments of the fronds ciliate; rhizome scales ciliate..... Thelypteris
 17. Rootstocks short, suberect; veins, at least the lowest, more than once forked; fronds cespitose, evergreen or subevergreen; rhizome scales sometimes toothed but not ciliate.. Dryopteris
12. Indusia inferior; fronds not evergreen, 18
 18. Rootstocks creeping; each sorus and its true cup-shaped indusium marginal or partly covered by a reflexed tooth of the frond..... Dennstaedtia
 18. Rootstocks not creeping; sori exposed, 19
 19. Indusia opening on one side; veins reaching margin of pinnae..... Cystopteris
 19. Indusia splitting into many stellate-spreading shreds; veins not reaching margin of pinnae..... Woodsia

Adiantum L. Maidenhair Fern.

This is a large genus, chiefly tropical. Gleason (1952) states that the name of the genus is derived from the Greek a-, without, and diainein, to wet, referring to the fact that the foliage repels rain-drops. They are ferns of rich and mesophytic to damp soils in tropical and temperate regions, with dark and often "polished" stipes, the main rib (costa) absent (in ours). Many species are well known in greenhouse and hothouse cultivation, but one is hardy and can be grown out of doors in the north. A favorite species for the greenhouse or as a pot plant is A. cuneatum, the Delta Maidenhair Fern from Brazil, the fronds of which are useful for decorative purposes when cut. Adiantum capillus-veneris, the Venus'-hair Fern, can be grown out of doors in the southern states, but in New York State it is best treated as a greenhouse plant.



Adiantum pedatum--Maidenhair Fern
[From Billington (1952), Fig. 77, p. 216.]

Adiantum pedatum L. Maidenhair Fern.

Meaning of Species Name. Pedately forking.

Other Names. Lock-hair Fern, Hair Fern, Rock Fern, Sweet Fern, American Maidenhair, Canada Maidenhair.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich hardwoods and along shaded streams.

Range. Que and Ont to Ak, s to Ga, La, and Okla.

Distr in NYS. Common in most secs of the state northw and westw but rare on the coastal plain of LI.

Distr in the Torrey Range. Throughout the range except in the pine barrens and the reg e and s of them, there not recorded.

Elevation. Grows to 5000 ft in Va.
Time of Fr. Summer; Jul-Aug at Cornell.
Origin. Native.

The leaves of this species are bitter and aromatic and have been considered useful in chronic catarrhs and other pectoral afflictions, by many more highly valued than Adiantum capillus-veneris. A tea of the leaves was used to treat coughs, colds, and hoarseness, and the rhizome was used as a stimulant, to soothe the mucous membranes of the throat, and to loosen phlegm. The fronds were likewise much used as an ingredient in "Syrup of Capillare." Some old writers have stated that the Maidenhair Fern was so called because it was used to dye the hair yellow; they confused this plant with Galium verum, one of the bedstraws, sometimes called Maid's Hair, the plant so used.

Several species of native ferns have been used for various medicinal purposes by the Indians, of which the most outstanding example is the Maidenhair Fern; Peter Kalm is the authority for the statement that the Indians of eastern North America commonly used it in cases of difficult breathing. They also used the roots as bitters and for respiratory diseases. This species never became official in the United States but it is still in current demand by drug companies.

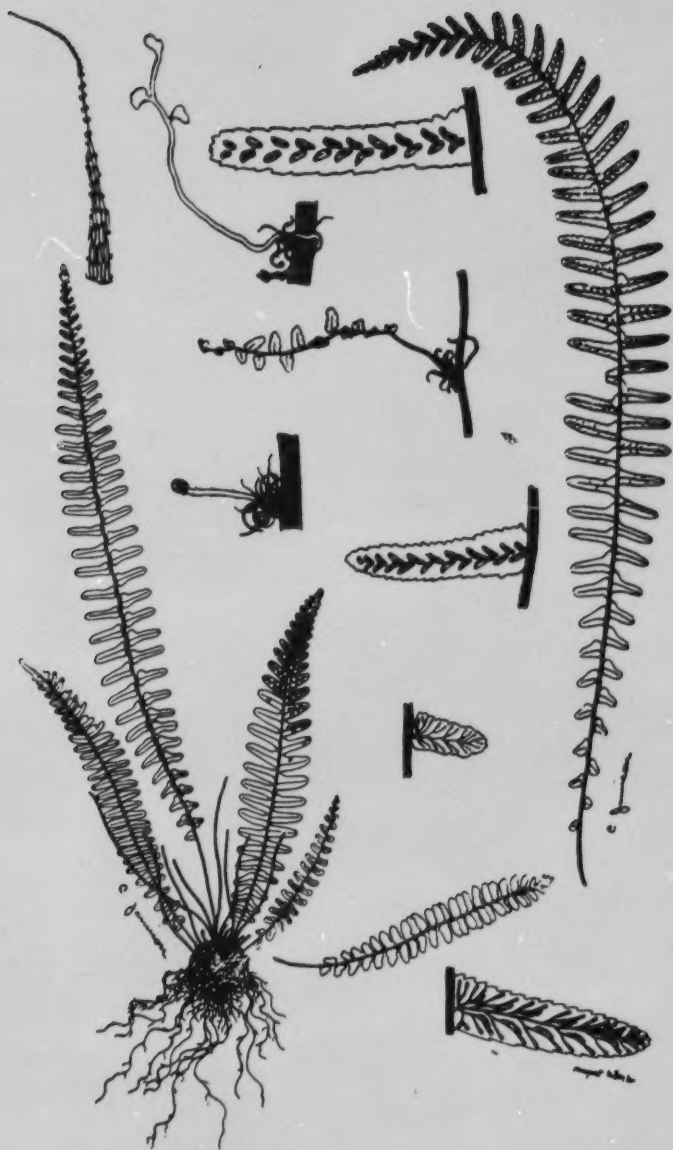
The Maidenhair Fern responds favorably to transplanting, but it needs a light humus soil. It makes a beautiful hardy plant for cool, moist, and shaded places in the wild garden, rock garden, and elsewhere.

Asplenium L. Spleenwort.

This is a genus of some 650 species or more, mostly tropical. The name of the genus is derived from the Greek a-, without, and splen, spleen, in reference to supposed medical properties. They are small, often evergreen, ferns with slender to filiform stipes having the vascular bundles of the stipe separate and peripheral or, if united toward the summit, forming a lunate bundle.

These ferns are great favorites for cultivation out of doors and under glass. The hardy cultivated kinds are natives of North America; the others grow wild in tropical Africa, India, and other countries. Among the hardy kinds are A. platyneuron, the Ebony Spleenwort, and A. trichomanes, the Maidenhair Spleenwort. They are mostly small ferns of tufted growth, best suited for planting in shady crevices in the rock garden, in rock walls, and in the wild garden. Both of them benefit by a limey soil.

Asplenium ruta-muraria, the Wall-rue Spleenwort, a plant native to the eastern United States as well as Europe, was once considered good for coughs and ruptures in children. One of its old names, Tentwort or Taintwort, was given to this plant because it was supposed to be a specific for a scrofulous disease called "the taint," an old name for rickets.



Asplenium platyneuron--Ebony Spleenwort
[From Shaver (1954), Fig. 82, p. 153.]

Key to Local Species of Asplenium

1. Fronds lance-linear, entire or undulate, tapering to prolonged slender rooting tips, cordate and round-auricled at base; stipes green..... A. rhizophyllum
1. Fronds 1-, 2-, or 3-pinnate, not entire nor with cordate, round auricled bases; stipes polished, brown to black, and terete at least below (blades of the fronds thin-coriaceous), 2
2. Fronds of 2 types, the upright fertile ones much larger than the small spreading basal ones; pinnae of erect fronds alternate, auricled at base, the larger ones 1-6 cm long. A. platyneuron
2. Fronds all similar, most or all of them fertile and loosely ascending to spreading; pinnae subopposite, without basal auricles, broadest above base, less than 1 cm long..... A. trichomanes

Asplenium platyneuron (L.) Oakes. Ebony Spleenwort.

Meaning of Species Name. Broad-nerved, an inappropriate name derived from an old figure with an exaggeratedly broad rachis.

Other Names. Screw Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Open woods, wooded slopes, rocky banks, and crevices of ledges.

Range. Que and Me to Ont, Ill, Mich, Wis, Ia, Kan, and Col, s to Fla and Tex.

Distr in NYS. Common in the s part of the state and in the s tier of counties, frequent in the Hudson valley northw to L Champlain, rare or largely absent from the Adirondack reg, frequent in c NY and northw to St Lawrence co, and infrequent or rare in the w counties.

Distr in the Torrey Range. Common throughout the range but less so in the pine barrens than elsewhere; more common, in the n, on limestone than on other rocks.

Elevation. Grows to 4200 ft in NC.

Time of Fr. Late May-Sep; Jun 25-Aug at Cornell.

Origin. Native.

Remarks. This species grows well in cultivation.

Asplenium rhizophyllum L. Walking Fern.

Meaning of Species Name. Rooting leaf.

Synonyms. Camptosorus rhizophyllum (L.) Link in Fernald (1950) and in Gleason (1952).

Other Names. Walking-leaf, Wall-link.

Type of Plant. A perennial herb, reproducing by spores and by leaves rooting at the tips, producing new plants.

Habitat. Shaded, preferably calcareous, rock, rarely in humus on tree trunks.

Range. Que to Ont and Minn, s to Ga, Ark, and Okla.

Distr in NYS. Unknown on LI and SI, local and rare from Westchester and Rockland co northw and westw, but rather abundant on exposed limestone formations from the Catskill reg northw to L



Asplenium rhizophyllum--Walking Fern
[From Billington (1952), Fig. 65, p. 194.]

George and westw across the state, and reported from a few stations in the n part of the state.

Distr in the Torrey Range. NY: From Westchester and Rockland co, northw.

Elevation. Grows to 2500-ft in Va, sea level-3900 ft in the Torrey range.

Time of Fr. May-Sep; Jul-Sep at Cornell.

Origin. Native.

This fern does well in terraria and wardian cases; it can be grown in the wild garden if given adequate shelter from drying winds and damp, mossy limestone rocks as a substrate medium.

Asplenium trichomanes L. Maidenhair Spleenwort.

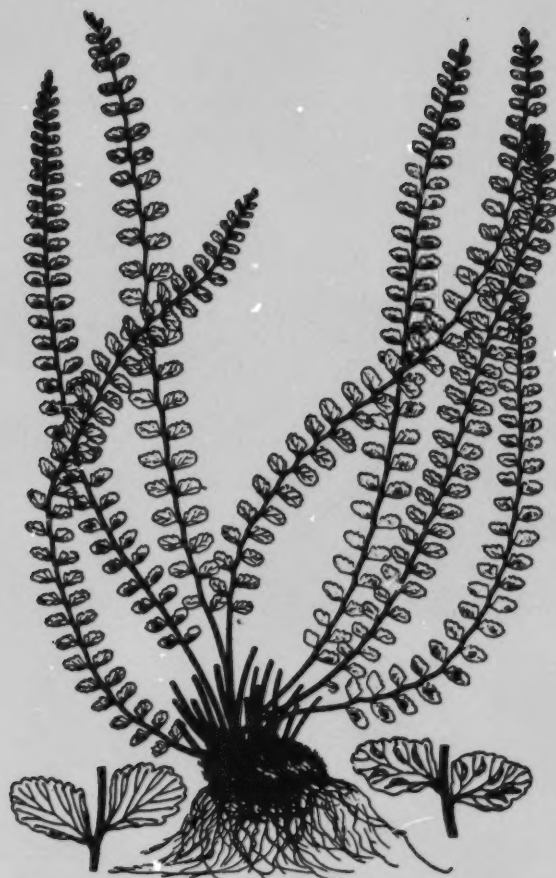
Meaning of Species Name. By pre-Linnean botanists placed in the genus *Trichomanes*.

Other Names. Wall Spleenwort, Dwarf Spleenwort, Waterwort, English Maidenhair, Black-stemmed Spleenwort, Waterwort Fern, Baby Fern, Rock Maidenhair, Water Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Shaded, often calcareous, rock crevices.

Range. NS and Que to Wis, ND, and Man, s to Va, upland to Ga and Ala, Ark, and Okla; Alta and BC, s to Col, Ariz, and Ore; also in Eurasia.



Asplenium trichomanes--Maidenhair Spleenwort
[From Small (1935), p. 68.]

Distr in NYS. Not reported from the extreme w and sw counties of the state; rare in Genesee and Monroe co, becoming more frequent in the limestone reg of c NY and eastw to the Hudson valley; extremely rare and largely absent from the Adirondack reg; not reported from s of Dutchess and Rockland co.

Distr in the Torrey Range. Throughout our range except in NJ s of New Brunswick, Middlesex co; not uncommon, reaching its best development on limestone.

Elevation. Grows to 2500 ft in Vt.

Time of Fr. Summer; Jun-Oct at Cornell.

Origin. Native.

The fronds of this species, one of the "maidenhair ferns" of continental Europe, have a sweetish, mucilaginous, somewhat astringent taste, once employed medicinally in that area for treating chronic catarrhs and other pectoral afflictions. They were formerly often substituted for those of *Adiantum capillus-veneris* in compounding the famous "Syrup of Capillare." A tea derived from this species also has a demulcent effect, considered useful in pulmonary disorders. In Arran,

the fronds have been dried and used as a substitute for tea; it acts as a laxative. In India it is considered as a laxative, anthelmintic, and an expectorant, highly useful in pulmonary disorders. This very dainty fern can be grown in the rock garden if given sufficient moisture and shelter from drying winds.

Athyrium Roth. Lady Fern, Spleenwort.

This is a large cosmopolitan genus of hardy and tender ferns widely distributed throughout the temperate and tropical zones, mostly in the northern hemisphere. The name of the genus is derived from the Greek a-, without, and thureos, shield, referring to the absence of a peltate indusium, in contrast to Polystichum; other authorities derive the name from the Greek athyros, doorless, the growth of the sporangia only tardily forcing back the outer margin of the indusia. They are herbaceous ferns with elongate pinnate to tripinnate or pinnatifid, soft, often fragile fronds, the green or greenish stipes furrowed or flattened above. This genus is sometimes merged with Asplenium.

A general favorite for growing out of doors is A. filix-femina, the Lady Fern, widely distributed throughout Europe, Asia, and North America, and easily grown in semishady positions. There are numerous forms of it, differing in the size and form of the fronds. Several tropical species are often grown in greenhouses.

Key to Local Species of Athyrium

1. Fronds simply pinnate, the pinnae long-attenuate with entire margins; sori straight, linear, 20-40 of them on each side of the midrib..... A. pycnocarpon
1. Fronds bi- or tripinnate, 2
 2. Fronds pinnate-pinnatifid (main leaf divisions deeply lobed but not cut all the way to their midribs): rachis and midnerves of main leaf divisions mostly with narrow scales; veins of leaf lobes mostly not forked.... A. thelypteroides
 2. Leaf blade twice or more pinnate (main leaf divisions divided to their midribs or still further divided); rachis and midnerves of main leaf divisions smooth; veins of leaf lobes mostly forked..... A. filix-femina

Athyrium filix-femina (L.) Roth ssp. angustum (Willd.) Clausen. Lady Fern.

Meaning of Species Name. Lady Fern, the Latin name originally applied to Bracken but transferred by Linnaeus to the present species, presumably on account of its fragility and delicate cutting as contrasted with the Male Fern, Dryopteris filix-mas; ssp. name, narrow.

Other Names. Backache-brake, Brake.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Damp thickets, meadows, streambanks, and swamps.

Range. Que to Ont and SD, s to Md, Tenn, and Mo.



Athyrium filix-femina ssp. *angustum*--Lady Fern
[From Billington (1952), Fig. 62, p. 193.]

Distr in NYS. Common throughout most secs of the state n of the coastal plain.

Distr in the Torrey Range. Throughout the range, but less common southw, especially in the pine barrens.

Elevation. Grows to 6000 ft in NC, 3000 ft in Delaware co.

Time of Fr. Summer; Jul-Sep at Cornell.

Origin. Native.

The name Lady Fern is of very ancient origin, going back to the time when this was supposed to be the species which bore the "mystic fern seed," so valued for its reputed power to render its possessor invisible. In those days it was "Female Fern," the Male Fern being Dracopis filix-mas. In Russia, "fern seed" was also supposed to confer second sight. This species is of easy cultivation in the garden and will grow in almost any soil if given moisture and partial shade.

The root of this species resembles in character that of the Male Fern and in Europe it was considered to possess similar medical properties, but it is less powerful in action, and, according to Puri (1970), quite ineffective. Some Indian tribes of Washington employed a tea of the boiled stipes of the Lady Fern to relieve labor pains. They also made a tea from the boiled rhizomes of this fern to relieve general body pains. The Chippewas boiled four lobes from the rhizome of this plant together with a handful of Stinging Nettle roots to make a decoction used to treat stoppage of urine.

Athyrium pycnocarpon (Spreng.) Tidestr. Narrow-leaved Spleenwort.

Meaning of Species Name. With crowded fruits.

Other Names. Glade Fern, Swamp Spleenwort, Kidney Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich, often calcareous, wooded slopes, ravines, talus slopes, and bottoms.

Range. Que and Ont to Minn, s to Ga, Ala, La, and Kan.

Distr in NYS. Locally abundant across the middle part of the state; not reported from s of the Catskill mts in Greene and Delaware co; not reported from the Adirondacks; frequent in c NY, but uncommon or rare from Onondaga co westw; not reported or at least very rare in the upper Hudson valley and the L George reg.

Distr in the Torrey Range. NY: The Catskills in Greene and Delaware co.

Elevation. Has been reported growing at 2300 ft in the Catskills, and sea level-3980 ft in the Torrey range.

Time of Fr. Aug-Sep; Aug 15-Sep 20 at Cornell.

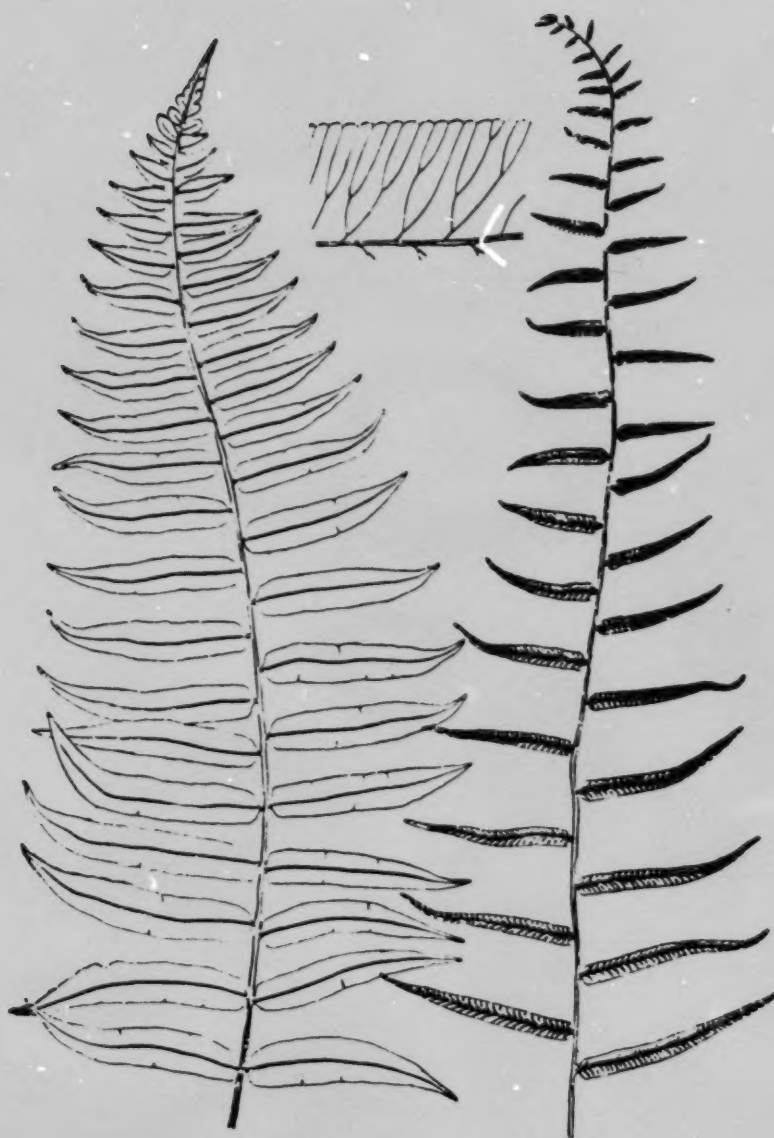
Origin. Native.

Athyrium thelypteroides (Michx.) Desv. Silvery Spleenwort.

Meaning of Species Name. Resembling Thelypteris palustris, the Marsh Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich woods, bottomlands, and shaded slopes.



Athyrium pycnocarpon--Narrow-leaved Spleenwort
[From Billington (1952), Fig. 62, p. 190.]



Athyrium thelypteroides--Silvery Spleenwort
[From Shaver (1954), Fig. 104, p. 191.]

Range. NS and NB to Ont and Ia, s to Ga, La, and Mo; also in e Asia.

Distr in NYS. Rare on SI; increasingly abundant or common northw throughout most secs of the state n and w of Putnam and Rockland co.

Distr in the Torrey Range. NY: Rare on LI and SI, increasing northw.

Elevation. Grows to 5000 ft in Va, sea level-3850 ft in the Torrey range.

Time of Fr. Jul-Sep; Jul 25-Sep 15 at Cornell.

Origin. Native.

Both this and the former species do well in a wild garden if provided with sufficient shade, protection from wind, and a light, rich, well-drained soil.

Cheilanthes Sw. Lip Fern

This is a large genus, mostly confined to arid regions, natives of the Malay Peninsula, tropical America, the United States, and China. The name of the genus is derived from the Greek cheilos, a margin or lip, and anthos, flower, referring to the submarginal sori. They are low ferns of warm and temperate regions (chiefly xerophytic), with mostly twice- or thrice-pinnate chaffy, pubescent or smoother fronds, the sterile and fertile ones often nearly alike, the divisions with the principal veins median. Some species with continuous indusia closely approach Pellaea; others with strongly dimorphic fronds simulate Cryptogramma. Most of them grow in dry rocky situations; the covering of hairs or farina (fine powder) on the fronds prevents excessive transpiration. Tropical species are sometimes grown in greenhouses but our native plants can be grown out of doors in milder parts of North America.

Cheilanthes lanosa (Michx.) D. C. Eat. Woolly Lip Fern.

Meaning of Species Name. Woolly.

Other Names. Hairy Lip Fern, Clothed Lip Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Cliffs, shale outcrops, rocky slopes, and gravelly banks, mostly in subacid soil.

Range. Ct and NY to Wis and Minn, s to Ga and Tex.

Distr in NYS. Rare in se NY.

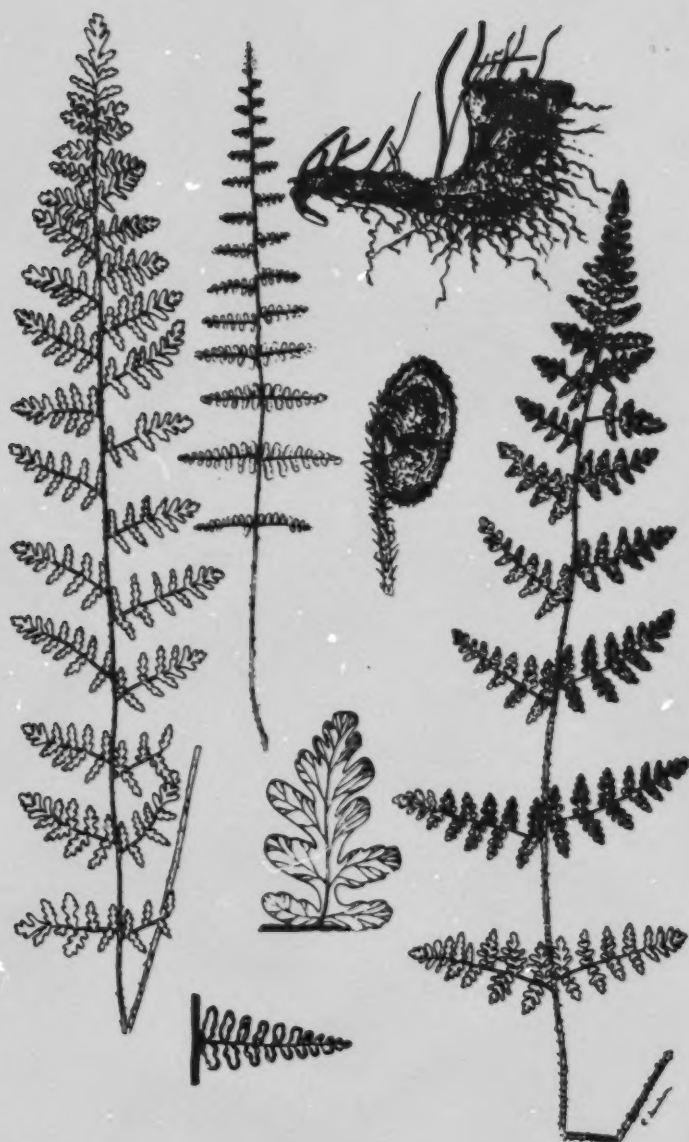
Distr in the Torrey Range. NY: Not uncommon in Manhattan and the Bronx and up the Hudson valley to near Poughkeepsie; unknown elsewhere.

Elevation. Grows to 1900 ft in NC; sea level-2980 ft in the Torrey range.

Time of Fr. Jun-Sep.

Origin. Native.

Remarks. Fronds curling during drought are revived by rain.



Cheilanthes lanosa--Woolly Lip Fern
[From Shaver (1954), Fig. 42, p. 75.]

Cryptogramma R. Br. Rock Brake.

There are two species of Cryptogramma, natives of temperate regions. The name of the genus is derived from the Greek kryptos, hidden, and gramme, line, referring to the lines of sori concealed by the reflexed leaf margins. They are ferns of cool regions of the northern hemisphere, strongly dimorphic, the fertile fronds taller and with narrower divisions than the sterile. The American Parsley Fern, C. crispa var. acrostichoides, grows 4-12 inches high and bears finely divided, parsley-like fronds that die down in autumn. It is suitable for the rock garden and does well in shady fissures of sandstone rocks.

Cryptogramma stelleri (Gmel.) Prantl. Slender Cliff Brake

Meaning of Species Name. Named for its discoverer, Georg Wilhelm Steller, 1709-1746.

Other Names. Fragile Cliff Brake; Steller's Parsley Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Cool shaded calcareous rocks and springy slopes; House (1924) says "On rocks and cliffs, preferring limestone."

Range. Nf and Que to Ak, s to NJ, Pa. WVa, Ill, Ia, Col, Utah, and Wash; also in Asia.

Distr in NYS. House (1924) reported it as "Rare"; it is now considered infrequent over the eastern portion of the state.

Distr in the Torrey Range. "A rare and local species so far collected only from Ct and NJ."

Time of Fr. May-Sep; Jun 25-Jul at Cornell.

Origin. Native.

This is one of our most delicate species and is able to live only in deep shade and moisture, yet the greater part of its range appears to be north of the United States. Kobbe (1926) reports that near Haines Falls in Greene County this species was found growing on shale containing 2.5 percent lime.

Cystopteris Bernh. Bladder Fern.

There are 10 or 12 species of Cystopteris; they are hardy, deciduous ferns that grow mostly in the temperate regions of Asia Minor, Europe, and America. The name of the genus is derived from the Greek kus-tis, bladder, and pterus, fern, referring to the inflated indusia. They are delicate plants with finely dissected pinnate fronds and are nearly cosmopolitan in cool or temperate areas. These ferns are suitable for cultivating in a cool, moist, shady rockery, and they make very attractive pot plants for the cool greenhouse. Cystopteris bulbifera is propagated by removing the bulbils on the fronds and pressing them into pots of light soil in summer.



Cryptogramma stelleri--Slender Cliff Brake
[From Billington (1952), Fig. 76, p. 215.]

Key to Local Species of *Cystopteris*

1. Blade lanceolate, usually broadest above the base, with an acute to acuminate but never greatly elongated apex; lower pinnules of pinnae decurrent on the rachis; veins ending mostly in teeth; no bulblets present; indusia acute or acuminate (9-15 pairs of pinnae)..... *C. fragilis*
1. Blade usually broadest at base, deltoid to lanceolate; lower pinnules not decurrent; veins most often ending in sinuses; bulblets frequently present, 2
 2. Blade gradually long-tapering to a narrow apex, which is often greatly elongated; indusia mostly truncated; very small stipitate glands frequently present on indusia or even on the lower sides of leaflets; leaflets and pinnules sessile or almost so; segments of leaves and of leaflets near their apices not strongly ascending (20-40 pairs of pinnae)..... *C. bulbifera*

2. Blade acuminate but never gradually long-tapering to a very greatly elongated apex; indusia sometimes ovate to lanceolate, acute or sometimes truncated or toothed apically, with entire or notched sides; leaflets petiolulate with pinnules (at least the proximal basal ones) also petiolulate or sometimes sessile; segments of leaves or of leaflets near their apices often oblong, with parallel sides and strongly ascending..... C. x tennesseensis

Cystopteris bulbifera (L.) Bernh. Bulblet Bladder Fern.

Meaning of Species Name. Bearing bulbs.

Other Names. Bulblet Fern, Bladder Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Shaded ravines, moist woods, rocky (often calcareous) slopes, and steep banks.

Range. Nf to Man and Utah, s to Ga, Tenn, Ark, NM, and Ariz.

Distr in NYS. In 1924 House reported that this species is common in the n, e, and c portions of the state and below 3000 ft in the Adirondacks; absent or very rare on the coastal plain, and rare s of Dutchess, Columbia, and Greene co; rare or at least (at that time) not reported from the Catskill mts, and uncommon or rare in the Susquehanna, Chemung, and Tioga valleys.

Distr in the Torrey Range. Columbia, Dutchess, and Greene co in the Hudson valley; not yet reported from the Catskills in 1915.

Elevation. Grows to 3500 ft in Va; sea level-2580 ft in the Torrey range.

Time of Fr. Jun-Sep; Jul-Aug at Cornell.

Origin. Native.

Cystopteris fragilis (L.) Bernh. var. mackavii Lawson. Fragile Fern.

Meaning of Species Name. Fragile; var. name, for its discoverer, Alexander Howard MacKay, 1848-1929.

Other Names. Common Fragile Fern, Fragile Bladder Fern, Common Bladder Fern, Bottle Fern, Brittle Fern, Bladder Fern, Brittle Bladder Fern, White Oak Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist rocky slopes, damp rocks, ledges, and rich open woods.

Range. NS to Mich and ND, s to Md, upland to NC, Tenn, and Mo; also in Eurasia.

Distr in NYS. Common northw across the state, in c NY, and in the w counties of the state; less common in the s tier of counties bordering on Pa and unknown on LI; very rare on SI; fairly common in the Hudson valley.

Distr in the Torrey Range. NY: Unknown on LI, rare on SI, thence increasing northw.

Elevation. Grows to 5000 ft in NH, sea level-3800 ft in the Torrey range.

Time of Fr. Jun-Sep; Jun 10-Aug 10 at Cornell.

Origin. Native.



Cystopteris bulbifera--Bulblet Bladder Fern
 [From Shaver (1954), Fig. 170, p. 323.]



Cystopteris fragilis var. *mackayii*--Fragile Fern
[From Small (1935), p. 125.]

Cystopteris fragilis is widely distributed, being found in Japan, Cape of Good Hope, India, Alaska, the West Indies, and in Greenland, where it grows within 12° of the North Pole, seemingly able to adapt itself to all kinds of climate.

Cystopteris x *tennesseensis* Shaver. Tennessee Bladder Fern.
(*C. bulbifera* x *C. fragilis*)

Meaning of Species Name. Of Tennessee.

Type of Plant. A perennial hybrid.

Habitat. Shaded ravines and moist woods.

Range. NY, s to Tenn, possibly elsewhere.

Distr in NYS. Not listed in House (1924), but since found in Clinton and Greene co.

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Jun-Aug.

Origin. Native.

Remarks. First described by Shaver from material collected in 1944 near Rome, Tennessee.



Cystopteris x tennesseensis--Tennessee Bladder Fern
[From Shaver (1954), Fig. 175, p. 331.]

Dennstaedtia Bernh. Hay-scented Fern.

There are about 50 species of Dennstaedtia, mostly tropical and subtropical ferns. The name of the genus commemorates August W. Dennstaedt, a German botanist of the early nineteenth century. They are pubescent ferns with slender creeping rhizomes. The Hay-scented Fern is sometimes planted in wild gardens. Two species are grown in greenhouses, or outdoors in warm countries--D. adiantoides and D. cicutaria, both from the West Indies and northern South America.

Dennstaedtia punctilobula (Michx.) Moore. Hay-scented Fern.

Meaning of Species Name. With dotted lobules.

Other Names. Boulder Fern, Fine-haired Fern, Hairy Dicksonia, Fine-haired Mountain Fern, Gossemer Fern, Pasture Fern.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Open woods, rocky slopes, pastures, and cleared land in rather sterile soil.

Range. Nf and NS to Ont and Minn, s to Ga, Ala, Ark, and Mo.

Distr in NYS. Common or frequent in the n, e, and c portions of the state, rare on LI and SI and w of Wayne co, frequent in the Catskill mts and Chenango co but uncommon or rare in the s tier of counties from Broome co westw.

Distr in the Torrey Range. Throughout the range except in the pine barrens; rare on LI, SI, and in s NJ.

Elevation. Grows to 5600 ft in Va; observed on the summit of Slide Mt at 4100 ft in Ulster co.

Time of Fr. Jul-Oct; Jul 25-Sep 15 at Cornell.

Origin. Native.

The fronds of this species are minutely glandular-hairy and when bruised give off a strong sweetish fragrance suggestive of new-mown hay.

In areas where this species has become a noxious weed, it can be controlled by mowing close to the ground with a scythe before spores are matured. Small patches can be grubbed out by hand or sprayed with a weed killer. Cultivation will eradicate the fern, but land infested with it usually is so rocky or steep that plowing is impractical. It is almost impossible to eradicate from stony soil.

Dryopteris Adans. Wood Fern.

This is a large and very complex genus of world-wide distribution. The name of the genus is derived from the Greek dryos, oak, and pteris, fern, according to some authorities, but Everett (1960) states that it is derived from the Greek dryad, wood nymph, and pteris, fern, alluding to the fact that they are woodland plants. All are of comparatively easy cultivation, and most of the native species are ideal for grouping boldly in open woodland or other shady positions. A number of species are also satisfactory greenhouse plants.

Dryopteris filix-mas, the Male Fern, is a native of Europe, Asia, northern Africa, and North America, the rhizomes of which have been much



Dennstaedtia punctilobula--Hay-scented Fern
[From Billington (1952), Fig. 61, p. 188.]

used in medicine. The roots of other species of fern, particularly D. spinulosa, were frequently substituted for the official root, and in the dried state it is difficult to distinguish them; Athyrium filix-femina also has similar properties, according to some authorities. The rhizome of the Male Fern is slightly tonic and astringent; it was used by the ancients as a vermifuge and is mentioned in the works of Dioscorides, Theophrastus, Galen, and Pliny. The Delaware Indians also used this species as a tapeworm expellent, but Vogel (1970) states that August Mahr is doubtless correct in saying that they acquired their use of this plant from the Europeans. This drug has also been much employed for similar purposes by veterinary practitioners. In large doses, however, it is an irritant poison, having proved to be particularly injurious to the eyesight, even causing blindness.

Key to Local Species and Subspecies of Dryopteris

1. Fronds 0.2-3 dm long, 0.8-6 cm wide, spicy-aromatic; lowest pinnae 0.2-2 cm long, 0.2-1 cm wide; indusia 1-2 mm broad, often overlapping, the sinus often obscure; basal scales 3-15 mm long; blades capitate glandular on the rachis, veins, and margins; a boreal xerophyte..... D. fragrans
1. Fronds 1-10 dm or more long, 4-40 cm wide, not especially aromatic; lowest pinnae mostly more than 2 cm long and 1 cm wide; indusia 0.4-2 mm broad, not overlapping, their sinuses distinct; basal scales 0.5-3.5 mm long; plants chiefly of woods and swamps, 2
 2. Fronds tripinnate, tripinnatifid, or bipinnate, evergreen or half evergreen, firmly membranaceous but hardly coriaceous; their ultimate segments only 3-15 mm long and 2-8 mm wide, finely pinnate-cleft or incised, with their teeth ending in mucronate or short bristle-like tips; basal scales of stipe ovate, 0.5-1.5 mm long; indusia 0.4-1.4 mm in diameter, 3
 3. Indusia glandular; frond bipinnate..... D. x boottii
 3. Indusia glabrous, or, if glandular, the frond finely tripinnatifid, 4
 4. Basal inferior and superior pinnules of lowest pinnae remote, 0.5-2 cm apart; the inferior 3-10 cm long, 2-4 times as long as the superior and commonly exceeding 2nd inferior pinnule; frond not glandular; indusia glabrous..... D. spinulosa ssp. dilatata
 4. Basal inferior and superior pinnules of lowest pinnae subopposite, rarely more than 4 mm apart; the inferior 1-6 cm long, if more than twice as long as the superior, not exceeding the 2nd inferior pinnule, 5
 5. Frond glabrous, twice pinnate; basal inferior pinnule usually longer than 2nd inferior one; indusia glabrous; scales of stipe entirely pale brown or cinnamon-color..... D. spinulosa ssp. spinulosa
 5. Frond commonly minutely glandular, especially on the rachis and rachillae, tripinnatifid or sometimes tripinnate; basal inferior pinnule shorter than to rarely exceeding the 2nd inferior one; indusia glandular; scales of stipe usually dark brown at base..... D. spinulosa ssp. intermedia

2. Frond bipinnatifid or bipinnate (sometimes tripinnatifid near base only), firm to coriaceous, the teeth without bristle tips; basal scales of stipe mostly more than 1.5 mm long; indusia 0.6-2 mm in diameter, 6
6. Sori marginal; fronds firm-membranaceous to coriaceous, blue- or gray-green..... D. marginalis
6. Sori not marginal; fronds firm-membranaceous to sub-coriaceous, 7
7. Fronds strongly dimorphic, strongly reduced toward base, the fertile much taller and narrower than the sterile, 0.6-1.8 dm broad, their pinnae often turned nearly at right angles to upper face of rachis; sori about medial..... D. cristata
7. Fronds essentially alike, flat, the fertile ones 0.7-4 dm wide, 8
8. Lowest pinnae of fertile frond with (15-)20-31 pairs of definite pinnules; fronds ovate to ovate-oblong, one-half to five-sixths as broad as long; basal scales of stipe firm, castaneous to blackish, lustrous; plant of rich temperate woods..... D. goldiana
8. Lowest pinnae of fertile fronds with 10-22 pairs of definite pinnules (excluding terminal teeth); fronds lanceolate to lance-oblong, slightly reduced toward base, the fertile ones one-fifth to half as broad as long; basal scales of stipe pale brown to cinnamon, thin and scarious; plant of swamps and wet woods..... D. clintoniana

Dryopteris x boottii (Tuckerm.) Underw. Boott's Wood Fern.
(D. cristata x D. spinulosa ssp. intermedia)

Meaning of Species Name. Named for its discoverer, William Boott, 1805-1887.

Other Names. Boott's Shield Fern, Boott's Fern.

Type of Plant. A perennial herb.

Habitat. Low woods and wet thickets.

Range. NS to Minn, s to Va and WVa.

Distr in NYS. Not listed in House (1924) except as a reported hybrid.

Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Jul-Sep.

Origin. Native.

This possibly somewhat fertile hybrid, intermediate between D. cristata and D. spinulosa ssp. intermedia, is often abundant through the coincident ranges of its parents. The frond is always twice pinnate below, with the lowest pinnae obviously shorter than the median ones, points that help to distinguish it from D. cristata.



Dryopteris x boottii--Boott's Wood Fern
[From Small (1935), p. 100.]



Dryopteris clintoniana--Clinton's Wood Fern
[From Small (1935), p. 102.]



Dryopteris cristata--Crested Wood Fern
[From Billington (1952), Fig. 53, p. 172.]

Dryopteris clintoniana (D. C. Eat.) Dowell. Clinton's Wood Fern

Meaning of Species Name. Named for its discoverer, George William Clinton, 1807-1885.

Synonyms. D. cristata (L.) Gray var. clintoniana (D. C. Eat.) Underw. in Fernald (1950).

Other Names. Clinton's Crested Fern, Clinton's Shield Fern, Clinton's Crest Fern; Clinton's Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Swamps and rich wet woods.

Range. Me and Que to Minn and Wis, s to NC, Tenn, and Mo.

Distr in NYS. Locally abundant across the state northw outside the higher Adirondacks; less frequent southw, and rare on LI and SI.

Distr in the Torrey Range. Throughout the range except on the coastal plain of NJ, there recorded from a single station.

Time of Fr. Jun25-Aug 15 at Cornell.

Origin. Native.

Dryopteris cristata (L.) Gray. Crested Wood Fern.

Meaning of Species Name. Crested.

Other Names. Crested Shield Fern, Crested Fern, Crest Fern, Crested Field Fern, Shield Fern, Swamp Wood Fern, Swamp Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Swampy open ground, marshes, thickets, and wet woods.

Range. Nf to Sask, s to NC, Tenn, Ark, Id, and Mont; also in Eu.

Distr in NYS. Common or frequent throughout most secs of the state except on LI and SI, where it is somewhat local or rare.

Distr in the Torrey Range. Throughout the range except in the pine barrens.

Elevation. Grows to 2700 ft in Md.

Time of Fr. Jun-Aug; Jun 25-Aug 15 at Cornell.

Origin. Native.

The roots, dug during the summer, then sliced and dried, have been used in infusion to clear phlegm from the chest and to induce perspiring to break fevers, also as a treatment for intestinal worms.

Dryopteris fragrans (L.) Schott. Fragrant Wood Fern.

Meaning of Species Name. Fragrant.

Other Names. Fragrant Cliff Fern, Fragrant Shield Fern, Fragrant Fern, Sweet Polypody.

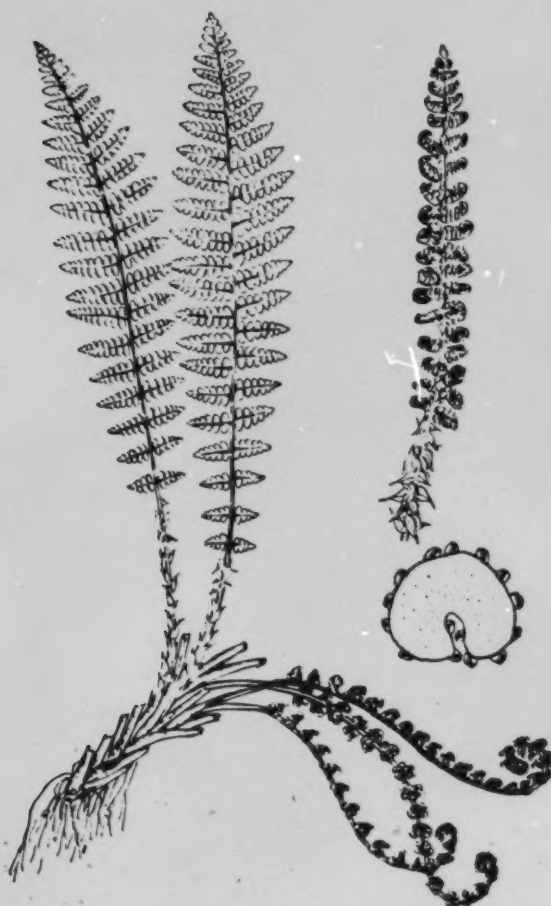
Type of Plant. A perennial herb, reproducing by spores.

Habitat. Shaded cliffs, rocky banks, and hillsides, often on limestone.

Range. Lab, Nf, and Ont, s to NE, NY, Mich, Wis, and Minn; also in Eurasia.

Distr in NYS. Rare and with approximately the same distribution as Woodsia alpina.

Distr in the Torrey Range. Not listed in Taylor (1915).



Dryopteris fragrans--Fragrant Wood Fern
[From Wherry (1961), p. 105.]

Elevation. Grows to 4000 ft in Vt.

Time of Fr. Jun-Sep.

Origin. Native.

This rare fern has glutinous fronds and a peculiar fragrance, something like new-mown hay composed largely of Sweetbriar Rose leaves. The greater part of its range is north of the United States. In Asia it is occasionally used as a tea, being valued as an antiscorbutic.

Dryopteris goldiana (Hook.) Gray. Goldie's Wood Fern.

Meaning of Species Name. Named for its discoverer, John Goldie, 1793-1886, an early American fern student.

Other Names. Goldie's Fern, Goldie's Shield Fern, Gold Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich, often calcareous, woods.

Range. NB to Ont and Minn, s to SC, Tenn, and Ia.



Dryopteris goldiana--Goldie's Wood Fern
[From Billington (1952), Fig. 55, p. 176.]

Distr in NYS. Rare or local. Not reported from LI and rare on SI; more frequent and locally abundant northw and westw in the state.

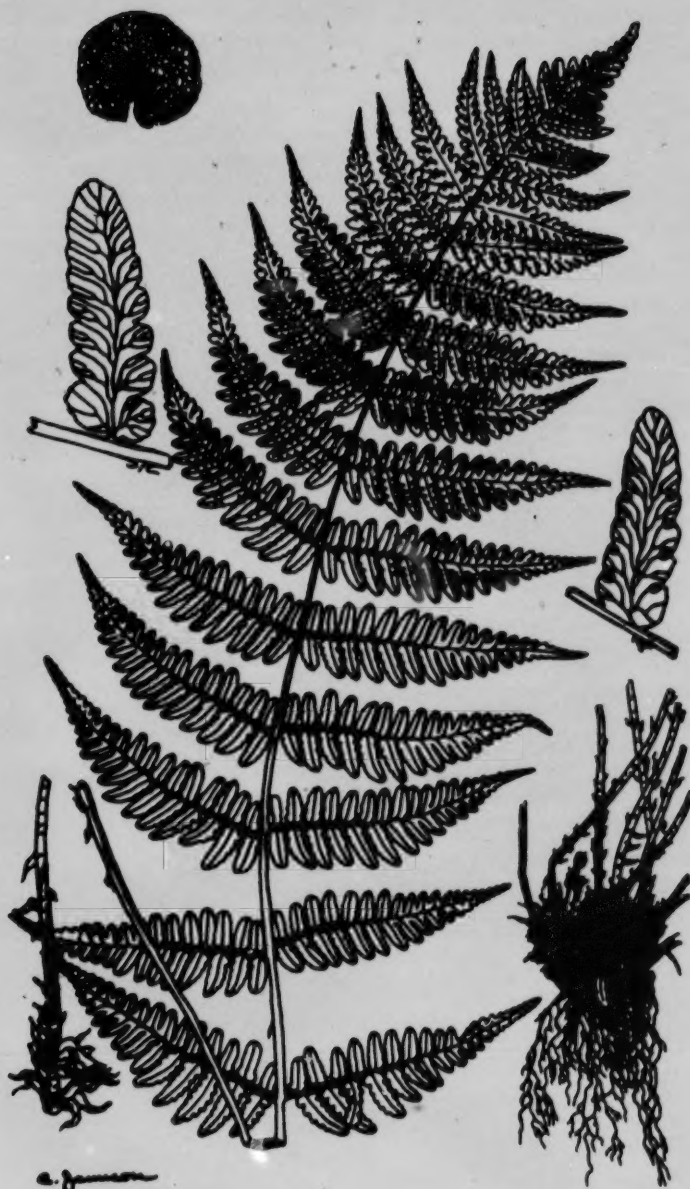
Distr in the Torrey Range. NY: Rare and local on SI, not reported from LI, increasing northw.

Elevation. Grows to 5000 ft in Va, 2500 ft in Vt; sea level--3900 ft in the Torrey range.

Time of Fr. Jun-Sep; Jul-Aug at Cornell.

Origin. Native.

Remarks. Responds well to cult in protected shady situations.



Dryopteris marginalis--Marginal Wood Fern
[From Shaver (1954), Fig. 123, p. 227.]

Dryopteris marginalis (L.) Gray. Marginal Wood Fern.

Meaning of Species Name. Marginal, from the placement of the indusia.

Other Names. Evergreen Wood Fern, Rock Fern, Marginal Shield Fern, Leathery Wood Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Woods, clearings, and rocky slopes.

Range. NS to Ont and Wis, s to Ga, Ala, Ark, and Okla.

Distr in NYS. Common across the state in most secs but rare on LI and rare, local, or absent in some secs of the Adirondacks.

Distr in the Torrey Range. Common throughout the range except in the pine barrens and e and s of them, there not recorded.

Elevation. Grows to 5000 ft in Va; observed at 3000 ft in Delaware co.

Time of Fr. Jun-Oct; Jun 20-Jul at Cornell.

Origin. Native.

Remarks. An excellent fern for cultivation in shady situations.

Under the name of American Aspidium or Marginal Fern, this species was official in the U.S. Pharmacopeia, 1882-1916, and in the National Formulary, 1942-65. The extract, called Aspidium oleoresin, extract of male fern, or male fern oleoresin, was used for anthelmintic and especially taenifuge purposes.

Dryopteris spinulosa (O. F. Muell.) Watt ssp. dilatata (Hoffm.) Piper. Mountain Wood Fern.

Meaning of Species Name. With minute spines; ssp. name, dilated.

Synonyms. D. spinulosa (O. F. Muell.) Watt var. americana (Fisch) Fern. in Fernald (1950); D. austriaca (Jacq.) Woyner var. austriaca in Gleason (1952).

Other Names. Broad Prickly-toothed Wood Fern, Spreading Shield Fern, Broad Shield Fern, Wood Fern, Broad Wood Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist woods, thickets, and banks, ascending to sub-alpine areas.

Range. Gl and Lab to Minn, Mont, Ore, and Ak, s to Pa, NC, Tenn, Id, and Wash.

Distr in NYS. Not common outside the higher elevations. Locally frequent in the higher Catskill mts of Greene, Ulster, and Delaware co and on many of the mountainous wooded slopes of the Adirondack and L George regs; scarce in c NY; reported from Monroe co and apparently very rare in the s tier of counties.

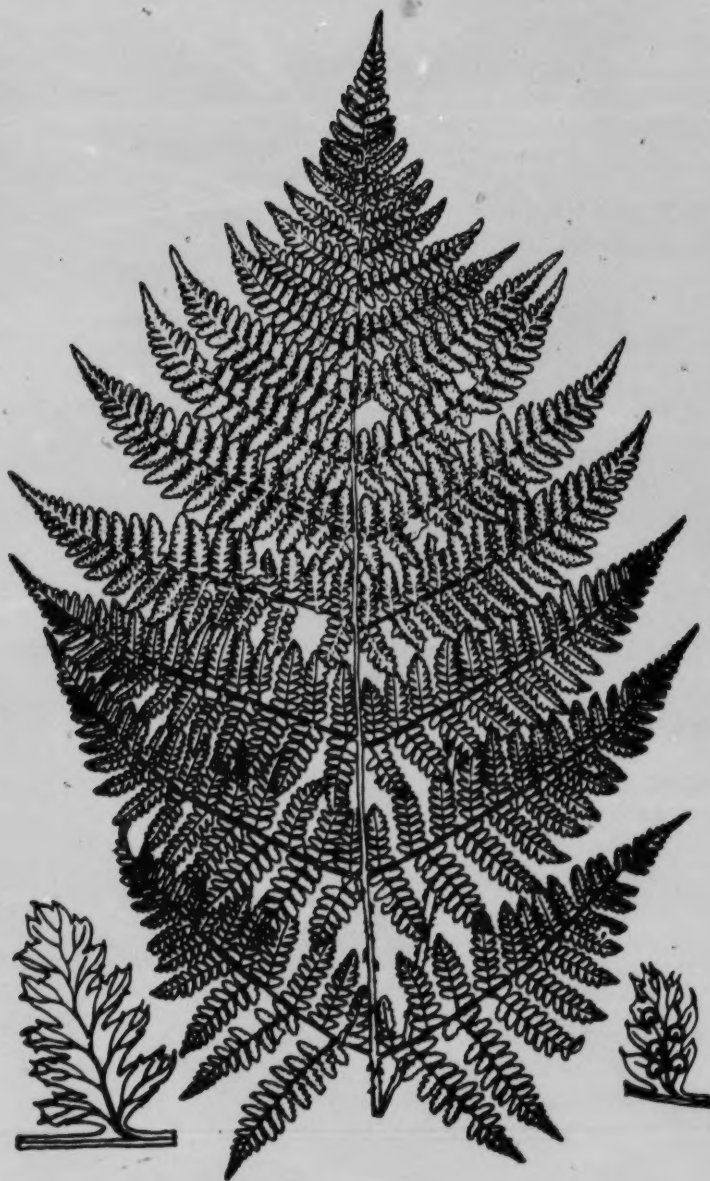
Distr in the Torrey Range. NY: the higher Catskills in Greene and Delaware co.

Elevation. 800-4020 ft in the Torrey range; observed on the summit of Slide Mt in Ulster co at 4100 ft.

Time of Fr. Summer.

Origin. Native.

It is said that the rootstock of this plant is the first vegetable food the Alaska Indians are able to obtain in spring. It is dug



Dryopteris spinulosa ssp. *dilatata*--Mountain Wood Fern
[From Shaver (1954), Fig. 146, p. 275.]

before the fronds develop and baked in pits lined with hot stones. It is reported to have a slightly sweetish taste but to be too smoky and tobacco-like in flavor for any but an Indian's palate. The Indians of California prepared a hair wash from the steeped fronds of this fern. They also sometimes treated cuts with its pulverized rhizomes.

Dryopteris spinulosa (O. F. Muell.) Watt ssp. intermedia (Muhl.) Stone.
Evergreen Wood Fern.

Meaning of Species Name. With minute spines; ssp. name, intermediate.

Synonyms. D. spinulosa (O. F. Muell.) Watt var. intermedia (Muhl.) Underw. in Fernald (1950); D. austriaca (Jacq.) Woyнар var. intermedia (Muhl.) Morton in Gleason (1952).

Other Names. Common Wood Fern, Fancy Fern, Common Shield Fern, American Shield Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Dry to wet woods, thickets, and banks.

Range. Nf to Ont and Ia, s to Ga, Ala, Tenn, WV, O, Ind, and Ill.

Distr in NYS. Common throughout most secs of the state.

Distr in the Torrey Range. Common throughout the range except in the pine barrens.

Elevation. Has been observed at 3000 ft in Delaware co.

Time of Fr. Jun 15-Aug at Cornell.

Origin. Native.

Remarks. The fronds of this subspecies are minutely glandular on the under side.

Dryopteris spinulosa (O. F. Muell.) Watt ssp. spinulosa. Spinulose Wood Fern.

Meaning of Species Name. With minute spines.

Synonyms. D. austriaca (Jacq.) Woyнар var. spinulosa (Muell.) Fiori in Gleason (1952); D. carthusiana (Vill.) H. P. Fuchs.

Other Names. Narrow Prickly-toothed Fern, Spinulose Shield Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Low woods, thickets, swamps, and banks.

Range. Que to Minn and BC, s to Va, WV, Ky, O, Ia, Mo, and Id; also in Eurasia.

Distr in NYS. Frequent in the Adirondack reg, c NY, n NY, and the w part of the state; rare or local in se NY.

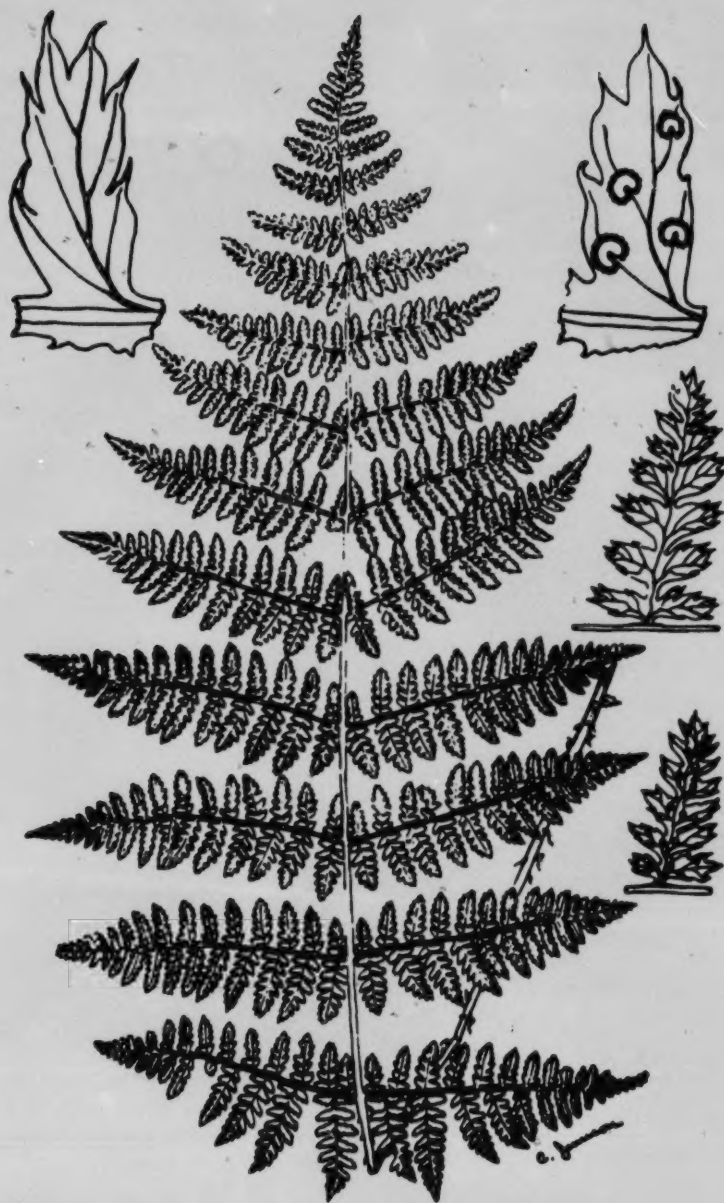
Distr in the Torrey Range. Common throughout Ct, NY, and Pa.

Elevation. Sea level-4020 ft in the Torrey Range.

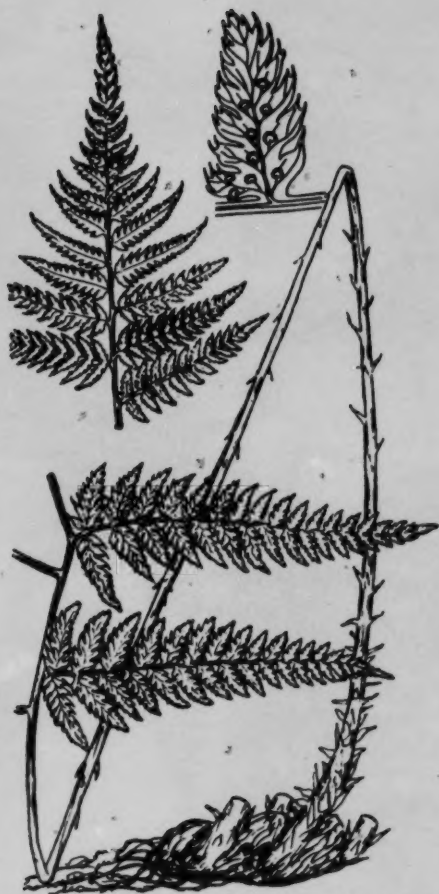
Time of Fr. Jun-Aug; Jun 15-Aug at Cornell.

Origin. Native.

The medical uses of this plant are identical with those of the Male Fern, with the rhizomes of which, as imported from the Continent to Great Britain, it has always been much mixed. The Spinulose Wood Fern was used in a root tea for stomach trouble by the Flambeau Ojibwas. One authority stated that this plant "appears to possess properties similar to the official drug" obtained from the Male Fern.



Dryopteris spinulosa ssp. *intermedia*--Evergreen Wood Fern
[From Shaver (1954), Fig. 142, p. 265.]



Dryopteris spinulosa ssp. *spinulosa*
Spinulose Wood Fern
[From Small (1935), p. 108]



Gymnocarpium dryopteris--Oak Fern
[From Small (1935), p. 122.]

Gymnocarpium Newm. Oak Fern.

There are about three species of Gymnocarpium in the northern hemisphere, of uncertain systematic relationship. The name of the genus is derived from the Greek gymnos, naked, and karpos, fruit, referring to the lack of indusia.

Gymnocarpium drvopteris (L.) Newm. Oak Fern.

Meaning of Species Name. Oak fern, from its woodland habitat.

Synonyms. Drvopteris disjuncta (Ledeb.) C. V. Morton in Fernald (1950).

Other Names. Pale Mountain Polypody, Tender Three-branched Polypody.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Cool, mossy, or rocky woods and talus slopes.

Range. Gl and Lab to Ak, s to Va, WVa, Mich, Wis, SD, Ia, NM, Ariz, and Ore; also in Eurasia.

Distr in NYS. Common northw across the state, less frequent or local westw and southw; in 1924 it was reported but not definitely known from LI.

Distr in the Torrey Range. NY: Reported from, but doubtfully on, LI, otherwise recorded only from the Catskills, according to Taylor, writing in 1915.

Elevation. Grows to 3000 ft in Delaware co; sea level-3900 ft in the Torrey range.

Time of Fr. Jun-Sep; Jun 15-Jul at Cornell.

Origin. Native.

Matteuccia Todaro. Ostrich Fern.

Gleason (1952) states that there are three species of Matteuccia; the other two are Asiatic. The name of the genus commemorates Carlo Matteucci, 1800-1868, an Italian physicist. Our species is a handsome, bold-foliaged species that responds well to cultivation. A closely related species is much favored by the Japanese for flavoring soups and salads, so much so, in fact, that the Japanese government has passed a law protecting the plant.

Matteuccia struthiopteris (L.) Todaro. Ostrich Fern.

Meaning of Species Name. Ostrich Fern.

Synonyms. Pteretis pensylvanica (Willd.) Fern. in Fernald (1950).

Other Names. American Ostrich Fern, Ostrich-feather Fern, Two-ranked Fern, Shuttlecock Fern, Fiddlehead.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich bottomland thickets and moist wooded slopes.

Range. Nf to Ak, s to Va, WVa, O, Ind, Ill, Mo, SD, and BC; also in Eu.

Distr in NYS. Common throughout most secs of the state but rare in some secs of the Adirondacks and apparently absent above 2500 ft; also absent from the coastal plain of LI and SI.

Distr in the Torrey Range. NY: The reg of the Catskills, in Delaware and Greene co.



Matteuccia struthiopteris--Ostrich Fern
[From Small (1935), p. 142.]

Elevation. Grows to 2000 ft in Vt; sea level-2300 ft in the Torrey range.

Time of Fr. Jul-Oct; Sep-Oct at Cornell.

Origin. Native

Remarks. This is the largest native fern of temperate North America; its fronds may be 6-10 or more feet long.

Fernald and Kinsey (1943) were most enthusiastic about the edible qualities of this species: "Few other substitutes for asparagus ever graced a slice of toast with as much promise of furnishing a substantial meal as lies in the thick, succulent, young unrolled fronds of the Ostrich Fern." In the Catskills it is quite plentiful along both branches of the Delaware river, where it is sufficiently abundant to be gathered in moderate amounts without fear of extermination if one takes care not to remove more than two or three crosiers from any one clump so as to avoid injuring the plant. In New York State, however, it must be remembered that this species, together with most of the other ferns, is protected by law and may not be gathered without permission from the

property owner. The fronds should be broken off as near the base as possible before they reach a height of 6 or 8 inches and while they are still curled. Wash the young fronds thoroughly, removing the dry papery scales (including those in the tightly coiled leafy tip), and break off the tough bases of the stalks. If the fronds are coated with a mat of fuzz, you have no doubt collected either the Cinnamon Fern or the Interrupted Fern; while both these ferns are edible, they in no way compare with the Ostrich Fern. "Fuzzyheads" are not fiddleheads!

In Northern New England men from commercial canneries set up "Fiddlehead Camps" in early spring, paying local residents 10¢ a pound to collect young fronds of the Ostrich Fern. In that area, "fiddleheading" has become a big, if seasonal, business during the last 60 years. The manager of one camp alone set a goal of 20 tons for the 1974 season, his area being a 35-mile radius of mountain country. The season is rather short, for "They grow like asparagus, six inches a day!" The fresh fiddleheads are delivered to processing plants where they are canned for shipment to specialty food shops. One of the largest of these canneries is W. S. Wells & Co. of Maine, specializing in dandelions and Vermont fiddleheads under the label Belle Maine. Experience in Vermont seems to indicate that picking does not injure the plant; as in the case of Asparagus, picking seems to stimulate growth of more stalks from the rootstock. "By letting some patches rest a couple of days, we'd be able to pick them two, or even three times," reports Lebentritt (1974). Fiddleheads are rich in vitamin C, keep well when refrigerated, and can be prepared in various ways--sauteed, steamed, en casserole, in cream soups, pickled, and au gratin, to suggest a few. They even make good sandwiches--"leftover cold fiddleheads on home-ground wheat bread with mayonnaise." Canned fiddleheads, however, are badly overcooked so, at least in Maine, except during the short time that fresh ones are available, they are mostly now sold from frozen food counters.

Young crosiers can be eaten just as they are picked, but most people prefer to boil them in salted water for 8 to 12 minutes to serve either hot or cold with hollandaise sauce, salad dressing, or sour cream. Berglund and Bolsby (1971) offer some quite sophisticated recipes for preparing Ostrich Fern, including fiddleheads with cheese and black butter, cream of fiddlehead soup with mushrooms, braised fiddleheads, steamed fiddleheads in wine, baked eggs with fiddleheads and meat, roast goose with fiddlehead stuffing, and pureed fiddleheads with smoked pork. In addition, Fernald and Kinsey (1943) suggest treating them like string beans and serving them with a cream sauce. "Cut into small pieces," they continue, "mixed with buttered (or oiled) bread- and cracker-crumbs, with milk, beaten egg and seasonings, and then baked until browned they make a superior escalloped dish." These authors also issue a warning which will bear repetition, not only in connection with ferns but for other plants as well:

"CAUTION. No one who is not perfectly sure that he knows a true fern from other delicately cut leaves should venture to eat the ... ferns. Many plants, such as the notorious Poison Hemlock and the related Beaver-poison, both deadly poisonous, have delicately cut leaves which by the untrained are often called 'ferns.'"



Onoclea sensibilis--Sensitive Fern
[From Billington (1952), Fig. 45, p. 154.]

Onoclea L. Sensitive Fern.

There is only one species, a hardy deciduous fern native in eastern North America and eastern Asia. Scattered sterile and fertile fronds are borne along a creeping and forking rhizome. The sterile fronds are long-stalked, with deltoid-ovate, deeply pinnatifid blades with anastomosing veins. It is coarse in appearance and has but limited use in gardens, but it is suitable for growing on the margins of ponds or streams, at the edge of a shrubbery, or in a moist border. The name of the genus was used by Dioscorides for some plant, certainly not this one, but one authority states that it is derived from a Greek word meaning "closed vessels," referring to the constricted sporophylls on the fertile fronds.

Onoclea sensibilis L. Sensitive Fern.

Meaning of Species Name. Sensitive, in the popular mind to early frost.

Other Names. Meadow Brake, Polypod Brake, Bead Fern.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Swamps, open woodlands, and meadows.

Range. Nf to Ont, Minn, Man, and SD, s to Fla and Tex; also in e Asia.

Distr in NYS. Common.

Distr in the Torrey Range. Common throughout the range except in the pine barrens.

Elevation. Grows to 3000 ft in Va.

Time of Fr. Sep-Oct at Cornell.

Origin. Native.

This species fruits best when growing in the open. The fertile fronds are often used in winter bouquets. In areas where it has become an undesirable weed, it can be controlled by the same methods as those outlined for Osmunda cinnamomea.

Weiner (1972) states that "The Iroquois Indians utilized the rhizomes of sensitive fern in times of scarcity." (In an emergency, practically any succulent, young unopened frond, or fiddlehead, could also be eaten.) However, he continues, "Also known as fiddleheads, these ferns have been sold in vegetable markets in the East as delicacies." While the American Indians undoubtedly made use of any available fiddleheads for food, including the abundant Sensitive Fern, it is primarily the Ostrich Fern that not only was, but still is, sold in eastern markets.

Kingsbury (1964) reports that limited experiments and field observations performed at the New Hampshire Agricultural Experiment Station indicate that this species is poisonous to horses when large amounts of it are present in hay. In one experiment, one horse developed symptoms of incoordination after 6 weeks on a diet composed entirely of hay containing about 17 percent of this fern. Symptoms reported in field cases were variable but basically nervous in character, and considerable variation in susceptibility and in amount of fern provoking symptoms among horses on the same diet were observed.

Polypodium L. Polypody.

This is a very large genus of some 600 species widely distributed throughout the world but particularly numerous in the tropics. The name of the genus is derived from the Greek polus, many, and podion, a little foot, in allusion to the many separate frond bases of the European Polypodium vulgare. The various species differ greatly in size, general appearance, and in the character of the frond. Several species are suitable for growing in hanging baskets, especially P. subauriculatum. P. vulgare ssp. virginianum, a hardy native species, requires a shaded or semishaded position and is suitable for planting in the rock garden and wild garden, in shaded borders, or in sheltered nooks in the shrubbery. An early

writer on the western Indians reported that the rhizomes of the California Polypody were eaten as a food staple by the "Sierra Indians."

Polypodium vulgare L. ssp. virginianum (L.) Hult. Rock Polypody.

Meaning of Species Name. Common; ssp. name, of Virginia.

Synonyms. P. virginianum L. in Fernald (1950) and in Gleason (1952).

Other Names. Common Polypody, Golden Polypody, Male Polypody, Golden-locks, Golden Maidenhair, Golden Maiden's Hair, Adder's Fern, Adder's-foot, Moss-fern, Woodfern, Male Fern, Sweet-fern, Rock-fern, Rock-brake, Stone-brake, Stone Fern, Wall Fern, Polypody of the Oak, Oak Fern, Cliff-fringe.

Type of Plant. A perennial herb, reproducing by spores and creeping rhizomes.

Habitat. Rocks, crests of ledges, bases of trees, and rocky slopes.

Range. Nf to Ont and Ak, s to Ga, Ala, Tenn, and Ark; also in Eurasia.

Distr in NYS. Common in most secs of the state.

Distr in the Torrey Range. Common throughout the range except in the pine barrens and e and s of them, there not recorded.

Elevation. Grows to 5600 ft in Va; observed at 3000 ft in Delaware co.

Time of Fr. Midsummer; Jul 15-Aug at Cornell.

Origin. Native.

Both the rhizome and fronds of the closely related European ssp. vulgare have long been used medicinally, as it was employed by the ancients as a purgative; it is the "Oak Fern" of the older herbalists. It acts as an alterative, tonic, pectoral, and expectorant, but its principal use has been as a mild laxative. It served likewise as a tonic in dyspepsia and loss of appetite and was considered both safe and reliable as an alterative in skin diseases. Grieve (1967) remarks that it was also used in hepatic complaints and was considered useful in coughs and catarrhal affection, particularly in dry coughs. An infusion prepared from 1/2 ounce of the crushed root in a pint of boiling water, sweetened, was taken in teacupful doses frequently, thought valuable in the early stages of consumption. The powder is stated to have been used with success for some kinds of worms. It sometimes produces a rash, but this disappears in a short time and causes no further inconvenience. A mucilaginous decoction of the fronds was formerly used in country places as a cure for whooping cough in children. For this purpose, the matured, fruiting fronds, gathered in the autumn, were dried; when required for use, they were slowly boiled with coarse sugar. It is still used as a demulcent in some areas of Europe.

The fresh root used to be employed in decoction, or powdered, for melancholia and also for rheumatic swelling of the joints. It was likewise considered efficacious in jaundice, dropsy, and scurvy, and, combined with mallow, was prescribed for hardness of the spleen, stitches in the side, and colic. The distilled water of the roots and leaves was considered by the old herbalists good for ague, and the fresh or dried roots,



Polypodium vulgare ssp. *virginianum*--Rock Polypody
[From Shaver (1954), Fig. 16, p. 37.]

mixed with honey and applied to the nose, were used in the cure of "polypus." In the 1800's American physicians used it in similar complaints and as a pectoral in chronic catarrh and asthma. At present, however, it is scarcely ever employed, being considered nearly inert, but an infusion of "Herba Polypodii" is prepared in India as a mild laxative and expectorant. An aqueous extract of "Rhizome Polypodii" is there recommended in the obstruction of viscera, for liver and gland diseases, and in the treatment of coughs and chills. In northern India this or a related species is also used as an alterative.

Polystichum Roth. Holly Fern, Christmas Fern.

This is a large genus of tender and hardy evergreen ferns found wild in many parts of the world, especially in Asia, North America, South Africa, Japan, and Europe, but most abundant in tropical mountains. The name of the genus is derived from the Greek poly, many, and stichos, rows, in allusion to the regular rows of sori. The native hardy species are of easy culture, thriving in somewhat acid woodland soil that is shaded from strong sun. They are shown to best advantage in woodland gardens and in rock gardens, as they are most attractive when associated with rocks. A number of species are also grown in the greenhouse, including the East Indian Holly Fern, P. aristatum, and its variety variegatum.

In Washington the Indians peeled the fleshy rhizomes of the Sword Fern (P. munitum) and baked them like potatoes with salmon eggs in pit ovens. Berries were sometimes placed on the fronds to dry.

Key to Local Species of Polystichum

1. Pinnæ unlobed, with a superior basal auricle; sterile and fertile fronds dissimilar, with 10-35 pairs of simple pinnæ; lower fertile pinnæ often much shorter than the upper sterile ones of the same frond, distant..... P. acrostichoides
1. Pinnæ pinnately parted with 9 or more pairs of pinnules, the lower subopposite; sterile and fertile fronds similar, with 20-60 pairs of approximate or overlapping pinnæ; lower fertile pinnæ scarcely smaller than the upper sterile ones of the same frond..... P. braunii

Polystichum acrostichoides (Michx.) Schott. Christmas Fern.

Meaning of Species Name. Resembling Acrostichum.

Other Names. Dagger Fern, Canker Brake, Christmas Shield Fern.

Type of Plant. A perennial herb, reproducing by spores.

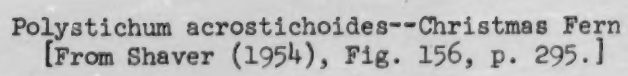
Habitat. Woods, open thickets, pastures, and rocky slopes.

Range. NS to Ia, Wis, and Kan, s to Fla, Tex, and Mex.

Distr in NYS. Common in most secs of the state; rare, local, or wanting in some parts of the Adirondacks and on LI.

Distr in the Torrey Range. Throughout the range except in the pine barrens.

Elevation. Grows to 2700 ft in Md; occurs at 3000 ft in Delaware co.





Polystichum braunii ssp. *purshii*--Braun's Holly Fern
[From Billington (1952), Fig. 59, p. 184.]

Time of Fr. Jun-Oct; Jun 10-Jul at Cornell.

Origin. Native.

This species has been extensively used in floral decorations in some areas; it is doubtless from this use of its fronds during the winter holidays that the plant derives its name of Christmas Fern.

Polystichum braunii (Spenner) Fee ssp. purshii (Fern.) Calder & Taylor.
Braun's Holly Fern.

Meaning of Species Name. Named to honor Alexander Braun, 1805-1877; ssp. name, for its discoverer, Frederick Traugott Pursh, 1774-1820.

Other Names. Pursh's Holly Fern, Prickly Shield Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Rich woods, glades, shaded rockslides, and ravines.

Range. Nf and Que to Ont, s to NE, Mass, NY, Pa, and n Mich.

Distr in NYS. Infrequent or local in the Catskill mts and the Adirondack reg; reported from Herkimer co.

Distr in the Torrey Range. NY: The Catskills in Ulster, Delaware, and Greene co.

Elevation. Grows to 5000 ft in Vt; 1450-4020 ft in the Torrey range.

Time of Fr. Jun-Sep.

Origin. Native.

Remarks. This species is a satisfactory fern for the wild garden, but it needs well-drained slopes with protection from wind and sun.

Pteridium Gled. Bracken.

This genus, which comprises two species, is of almost world-wide distribution. The name is a diminutive of Pteris, another kind of fern, a genus with which it has often been merged. Ours is a highly variable species with an extensively creeping and forking perennial subterranean hairy black rhizome, stiff upright stipes alternate upon the rhizome, and coarse and firm, often tripinnate fronds, with revolute-margined segments. It may reach a height of 15 feet or more, and, although dying in autumn, often remains standing through the winter, affording in some regions cover for game. It is sometimes a troublesome weed, especially in Great Britain and western North America. Bracken is not ordinarily cultivated in gardens, as it is too rampant in growth. The rhizomes spread rapidly underground and, once well established, are difficult to eradicate; the smallest portion left in the ground is capable of forming a new plant.

Pteridium aquilinum (L.) Kuhn ssp. latiusculum (Desv.) Hult. Bracken.

Meaning of Species Name. Of an eagle, from the wing-shaped fronds; ssp. name, rather broad.

Other Names. Brake; Brake Fern, Pasture Brake, Hog Brake, Earn-fern, Eastern Bracken, Western Bracken, Western Brake-fern, Eagle Fern, Lady Bracken, Adder-spit, Turkey-foot Fern, Umbrella Fern, Upland Fern.

Type of Plant. A perennial herb, reproducing by spores and creeping rootstocks.

Habitat. Sterile soil of dry open woods, clearings, burns, and abandoned farms.

Range. Nf to Ont and SD, s to NC, Tenn, and Okla; isolated in Miss, Wyo, Col, and Mex; also in Eurasia.

Distr in NYS. Very common in most secs of the state but rather scarce in some of the limestone regs.

Distr in the Torrey Range. Throughout the range, but apparently less common in Ct than elsewhere in our range.

Elevation. Grows to 5000 ft in Va; occurs at 3000 ft in Delaware co.

Time of Fr. Summer; Aug 25-Sep at Cornell.

Origin. Native.

Remarks. Because of its subterranean rhizome, it is fire-resistant and re-establishes itself quickly after a burn.

Bracken is one of our commonest ferns, yet surprisingly few people are aware of its widespread use as a green vegetable, particularly in Japan and Korea, but its use for food has by no means been restricted to that area. Dagilty (1907) reports on one investigation of Bracken as a food item: "Excepting possibly Australia, it is in Western Oregon, Washington and British Columbia that it reaches its highest development. In this American area it is not only the most common fern, but the largest as well. In tenderness and thickness [the young] ... leafy-shoots are very like asparagus. [But] ... neither horse nor cow will eat them [as] ... the ... leaf-stalk [is] ... densely covered with hairs, which are bitter to the taste.

"It was conceived that these succulent shoots might be valuable as food, so in the spring of 1906 material was gathered for experimental purposes. The upper portion of the shoot was used.... The extreme tips are so rolled up and covered with hairs that it takes too long to clean them, hence they were cut off.... In stalks three feet long as much as one foot is tender. The hairs or scales ... may ... easily be removed by an ordinary vegetable brush.

"To test their palatableness, the dishes were prepared in quantity and offered to classes of fifteen to twenty for judgment. Perhaps three-fourths of these pronounced them good. The taste is not exactly like that of anything else ... [but] to many it suggests the almond.

"In food values, it compares well with other vegetables of the kind, its nutritive value being near that of cabbage. In comparison with asparagus, which it most resembles, it proves to be superior, containing .87 as much protein, 1.7 as much fat, and 1.6 as much carbohydrates.

"The brake was used by the Indians of the Northwest coast before the introduction of wheat flour, but the part used was the subterranean stem. This was dug up, washed, dried, pounded fine, and the coarse shreddy parts removed by sifting. The starchy powder was used as flour. Its use has been discontinued since the introduction of wheat flour."

Those who may wish to experiment with Bracken as a substitute for Asparagus should select the stouter stalks when very young and not more than 6 to 8 inches high. Break them off at the base and draw them through the fingers to remove the hairs. After washing them, boil in salted water until tender (usually 15 minutes to half an hour); add some butter, season to taste, and they are ready to serve, hot or cold. Hollandaise sauce, mayonnaise, or sour cream gives an added flavor, or they



Pteridium aquilinum ssp. *latiusculum*--Bracken
[From USDA Agr. Research Sv. (1971), Fig. 3, p. 9.]

can be creamed and served like string beans. Added to a sauce made from condensed cream of mushroom soup, they make a good dish to serve on toast.

The raw stalks have a mucilaginous juice, so some people enjoy eating the uncooked stalks as a relish. It is reported that some tribes of Indians often ate the young raw sprouts when stalking deer in spring "so that his breath does not betray his presence," thus enabling the hunter to get within bow range. The juice is somewhat altered in cooking, but the boiled vegetable retains some of its mucilaginous quality, which is not attractive to some palates, but many people find that when properly prepared Bracken makes an interesting and novel dish.

There are reports, denied by some (See Fiddlehead Forum--Bulletin of the American Fern Society, Vol 2, No. 4, July 1975), that the unfolding fronds of this species are both carcinogenic and mutagenic even after cooking. Such reports usually result from massive feeding of experimental animals under laboratory conditions. In this connection, a remark by Arehart-Treichel (1976), an employee of the Food and Drug Administration, will bear consideration: "Dosing animals with enormous amounts of chemicals is nearly always going to produce toxic effects. But how often are people exposed to such large doses?" One must naturally take reasonable precautions against toxic chemicals, but this writer doubts that serving Bracken two or three times a year is likely to have serious consequences. On the other hand, very young and very old persons do not have the same liver-enzyme defenses against toxic chemicals that the general population does, and some persons are born with genetically defective liver enzymes, so perhaps some caution is advisable.

Close relatives of our Bracken growing in New Zealand, Australia, Europe, and in the western part of the United States have a starchy layer in the rootstock, which is made available by crushing, but the rootstocks of eastern plants have too little starch to be of value. In Europe, however, plants produce a starch much used in times of scarcity, for one authority reported that "the people of Normandy have sometimes been compelled to subsist on bread made from brake roots." When Europeans first visited the Canary Islands in 1405, Bracken was the only edible root on the islands, one authority stating, "as for grain they had none; their bread was made of fern roots." Later, the rhizomes were ground to powder and mixed with barley meal, which could either be boiled or made into bread. Bracken was an important food item among the Maoris of New Zealand, and the young shoots are still much prized by the Japanese. In Japan, before cooking, the tender shoots are first washed carefully in fresh water, plunged into boiling water for 2 minutes or so, and then immersed again in cold water for a couple of hours. After this preparation they can be used in soup, prepared as a puree, like Spinach, or like Asparagus heads, being served as a side dish. They seem somewhat insipid to some Western tastes, but they are considered such a delicacy in Japan that the government was forced to pass drastic laws to prevent the extermination of this plant.

The Indians of Vancouver Island and the neighboring country regarded Bracken as a great luxury, gathering the roots to boil and eat as food. Weiner (1971), speaking primarily of the western Indians, stated

that, "Bracken was by far the most valuable of the edible ferns so far as Indian use is concerned. In some cases it was a major constituent of a tribe's sustenance." Early settlers in California may have learned the use of this plant from the Indians, for one writer states that "the young, tender shoots are boiled by the California miners and eaten like Asparagus, being found mucilaginous and palatable." This species was also used as a potherb in New England, however, so the idea of using it as a vegetable may not have been a novel one. In Siberia and Norway, the uncoiled fronds have been employed with about two-thirds of their weight of malt for brewing a kind of beer. In any case, Bracken can be considered a useful survival food, but only the young plants should be eaten; the older stalks are not palatable, a fortunate circumstance, perhaps, for the full-grown fronds are toxic and have been responsible for poisoning grazing stock.

The astringent properties of the rhizome have been used in a decoction recommended for the dressing and preparation of kid and chamois leather. Before the introduction of soda from sea salt and other sources, the large amount of alkali obtained from the ashes of Bracken was found serviceable for glass-making, both in the northern parts of Great Britain and in other countries, and was used freely for that purpose. The ash also contains enough potash to be used as a substitute for soap. The ashes are mixed with water and formed into balls; these made hot in the fire have been used in Europe to make lye for the scouring of linen. In other areas, tallow boiled with Bracken ash has been used to make soap.

The potash yield of Bracken ash is so considerable that in view of the present scarcity of fertilizers, this source of supply may well be worth attention. Potash is a particularly valuable fertilizer for potato and sugar-beet land, especially for light loams, gravels, and sandy soils. The best time for cutting Bracken for burning is from June to the end of October, but the ash from green Bracken is much more valuable than that from old withered plants. In the month of June, the fronds and stipes hold as much as 20 percent of potash, but in August that amount is reduced to 5 percent. Potash from Bracken is soluble in water and should not be exposed to rain; as soon as the ashes are cool, they should be kept dry until required for use.

Formerly, in both the green and the dried state, Bracken was used as fodder for cattle. When dry, it makes excellent litter for both horses and cattle; it also makes a very durable thatch. The young tops of the fern are boiled in Hampshire for pigs' food. The fronds are much used as packing material for fruit, keeping it fresh and cool. The dried fronds can likewise be used in the garden for protecting tender plants. In the 17th century it was customary to set growing Bracken on fire, believing that this would produce rain. A like custom of "firing the Bracken" still prevails today on the Devonshire moors.

In the "fiddlehead" stage, the young fronds have been used as the source of a yellowish-green dye for wool, with an alum or chrome mordant. To dye 1 pound of wool, about 1 pound of the young shoots were steeped in hot water for 2 hours, after which the liquid was strained when cool

enough to handle. The mordanted, wetted wool was then immersed in the warm dye bath and simmered for 1 hour, after which it was rinsed and dried. Using alum and copperas results in an olive color; in Scotland the rhizome was used to obtain a yellow dye, and a gray dye for silk was prepared, using an iron mordant.

The ancients used both the fronds and stems of the Bracken in diet drinks and medicine for many disorders. Culpepper gives several uses for it: "The roots being bruised and boiled in mead and honeyed water, and drunk kills both the broad and long worms in the body, and abates the swelling and hardness of the spleen. The leaves, eaten, purge the belly and expel choleric and waterish humours that trouble the stomach. The roots bruised and boiled in oil or hog's grease make a very profitable ointment to heal the wounds or pricks gotten in the flesh. The powder of them used in foul ulcers causes their speedier healing."

Culpepper also remarked that "Fern, being burned, the smoke thereof drives away serpents, gnats, and other noisome creatures, which in fenny countries do, in the night-time, trouble and molest people lying in their beds with their faces uncovered." Gerard says that "the root of Ferne cast into an hogshead of wine keepeth it from souring." "For thigh aches" (sciatica), advised another old writer, "smoke the legs thoroughly with Fern Bracken." This is also one of the species reputed to bear the "mystic fern seed." It was then known as the "female fern" (a name later transferred to Athyrium filix-femina, the Lady Fern), the "seed" of which could be obtained only on midsummer eve.

The rhizome is astringent and in India is considered useful for diarrhea and inflammation of the gastric and mucous membranes. Boiled in oil or lard, the rhizome is made into an ointment for wounds. A decoction of the rhizome and fronds has been given in chronic disorders arising from obstruction of the viscera and spleen. An infusion of the plant has been used to expel intestinal worms and to treat diarrhea. American Indians were also aware of the medical properties of this species. Some tribes employed it in cases of insufficient milk secretion, the rhizome being pounded and steeped in water for use as a drink by Menominee women to relieve plugged milk ducts. It was also used by the Delawares as a diuretic to increase urine flow and by the Ojibwas in treating stomach cramps in women.

Bracken is poisonous when eaten by stock. In central New York cows have been poisoned by eating the fronds during dry seasons or in late summer when other green vegetation is scarce. Kingsbury (1964) states that ingestion of large amounts of Bracken fronds over an extended period of time produces an acute disease of sudden onset, brief duration, and usually fatal termination. A few imperfectly described instances of suspected Bracken poisoning in pigs have been reported in England. Sheep are more resistant than cattle to Bracken poisoning; natural cases are rare, however, and none has been reported in the United States. Bracken poisoning of horses was first reported in North America in 1917, following severe loss of stock in British Columbia. In all cases the horses were stabled and fed poor-quality, bracken-containing hay; some horses even contracted bracken poisoning from ingestion of their bedding.

In some areas this species has become an obnoxious weed. Clean cultivation will destroy the rootstocks. Muenscher (1935) suggests that recently cleared land infested with Bracken should be plowed deep and the rootstocks harrowed out, piled, and burned. In pastures mow or pull the fronds twice a year before spores are matured, usually in July and August, but the exact dates vary somewhat with the locality. It is also helpful to fertilize infested areas, and pastures can be grazed closely with sheep. Small patches can be sprayed with a weed killer.

Thelypteris Schmidel. Beech Fern, New York Fern, Marsh Fern.

This is a large cosmopolitan genus, best developed in temperate and subtropical Asia. The name of the genus is derived from the Greek thelus, female, and pterus, fern.

Key to Local Species of Thelypteris

1. Blades triangular, broadest at base, 2
 2. Wings of rachis not extending down to the lowest pinnae; frond narrower than long, commonly strigose pubescent, the rachis and lower surface more or less chaffy with brown scales; united upper and lower segments of opposite sides of pinnae not forming a fiddle-shaped wing, these pinnae bent upward, perpendicular to the leaf surface..... T. phegopteris
 2. Wings of rachis extending down to lowest pinnae; frond nearly or quite as broad as long, rarely strigose, minutely glandular-puberulent on rachis and veins beneath, at most with a few white scales; united upper and lower basal segments of opposite pinnae forming a fiddle-shaped wing, these pinnae in the same plane as the rest of the blade..... T. hexagonoptera
1. Blades narrowly lanceolate, narrowed toward the base, 3
 3. Blades strongly narrowed toward the base, the lowest pinnae rudimentary; stipes much shorter than the blades; veins mostly simple..... T. noveboracensis
 3. Blades only slightly narrowed toward the base, the lowest pinnae not rudimentary; stipes nearly as long as or longer than the blades; veins of the sterile blades forked, those of the fertile partly simple, partly forked..... T. palustris

Thelypteris hexagonoptera (Michx.) Weatherby. Broad Beech Fern.

Meaning of Species Name. Hexagonal or six-cornered fern, from the angular subsections of the winged rachis.

Synonyms. Dryopteris hexagonoptera (Michx.) Christens in Fernald (1950).

Other Names. Hexagon Beech Fern, Six-angled Polypody.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist woodlands and thickets; House (1924) gives "In dry woods and on open slopes."

Range. Que and Me to Ont and Minn, s to Fla and Tex.



Thelypteris hexagonoptera--Broad Beech Fern
[From Billington (1952), Fig. 51, p. 166.]

Distr in NYS. Rare on LI and SI; common northw and in the Catskills, and frequent or locally abundant in the c and w portions of the state.

Distr in the Torrey Range. NY: Rare on LI and SI, increasing northw and becoming common in the Catskills.

Elevation. Sea level-4020 ft in the Torrey range.

Time of Fr. Jun 25-Aug 10 at Cornell.

Origin. Native.

Thelypteris noveboracensis (L.) Nieuwl. New York Fern.

Meaning of Species Name. Of New York.

Synonyms. *Dryopteris noveboracensis* (L.) Gray in Fernald (1950).

Other Names. Bear's-paw.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Dry to damp woods, thickets, and swamp margins.

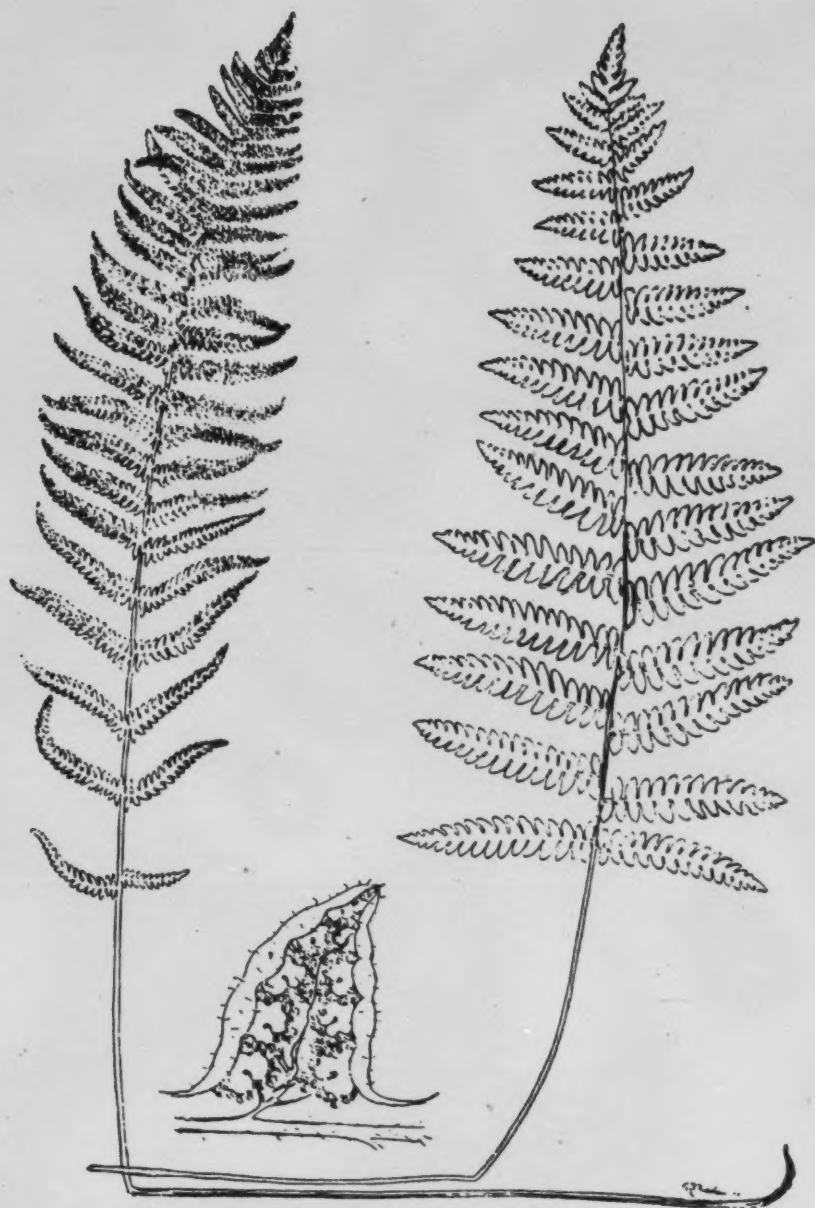
Range. Nf to Ont and Minn, s to Ga, Miss, and Ark.

Distr in NYS. Common throughout most secs of the state.

Distr in the Torrey Range. Common throughout the range except in the pine barrens.



Thelypteris noveboracensis--New York Fern
[From Billington (1952), Fig. 47, p. 160.]



Thelypteris palustris ssp. *pubescens*--Marsh Fern
[From Billington (1952), Fig. 46, p. 158.]

Elevation. Grows to 5000 ft in Va; observed on the summit of Slide Mt at 4100 ft in Ulster co.

Time of Fr. Jun-Sep; Aug-Sep 15 at Cornell.

Origin. Native.

Remarks. Sometimes sweet-scented in drying, with a lemon-like or vanilla-like odor.

Thelypteris palustris Schott. ssp. pubescens (Lawson) Holub. Marsh Fern.

Meaning of Species Name. Of marshes; ssp. name, pubescent.

Synonyms. Dryopteris thelypteris (L.) Gray var. pubescens (Lawson) Nakai in Fernald (1950).

Other Names. Meadow Fern, Snuffbox Fern, Marsh Shield Fern, Wood Fern, Swamp Fern, Quill Fern, Ground Fern, Creeping Water Fern, Beaver Meadow Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Bogs, swamps, sterile meadows, low woods, and thickets.

Range. Nf to Ont and Man, s to Fla and Tex; also in Bermuda, Cuba, S Afr, and Eurasia.

Distr in NYS. Common.

Distr in the Torrey Range. Throughout the range, but less common in the pine barrens than elsewhere.

Elevation. Grows to 2000 ft in Vt.

Time of Fr. Jun-Oct; Aug-Sep at Cornell.

Origin. Native.

Thelypteris phegopteris (L.) Slosson. Narrow Beech Fern.

Meaning of Species Name. An old generic name meaning Beech Fern.

Synonyms. Dryopteris phegopteris (L.) Christens in Fernald (1950)

Other Names. Northern Beech Fern, Long Beech Fern, Sun Fern, Common Beech Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Moist cliffs, woodlands, and hillsides.

Range. Gl and Lab to Ak, s to NC, Tenn, Ia, and Ore; also in Eurasia.

Distr in NYS. Common throughout the Adirondack and L George regs; frequent in the Catskills and local southw to Westchester co; rare or local in c and w NY, but frequent in the Susquehanna reg.

Distr in the Torrey Range. NY: Not definitely known from LI or SI, but reported from the former and local in n Westchester co, increasing northw.

Elevation. Grows to 4000 ft in Vt; sea level-3980 ft in the Torrey range; 3000 ft in Delaware co.

Time of Fr. Jun 25-Jul at Cornell.

Origin. Native.

Remarks. Clute (1938) states that this species grows in greatest luxuriance on cliffs and in ravines where dripping ledges provide dwelling places to its liking.



Thelypteris phegopteris--Narrow Beech Fern
[From Shaver (1954), Fig 154, p. 291.]

Woodsia R. Br. Woodsia.

This is a genus of a dozen or more species of deciduous and evergreen ferns, of which there are hardy and tender kinds. They are natives of North America, Europe, and northern Asia, chiefly of the north temperate zone. The name of the genus commemorates Joseph Woods, 1776-1864, an English botanist. They are low and rather small tufted ferns with pinnately divided fronds. The hardy kinds are sometimes planted in rock gardens in a sheltered, shaded location.

Key to Local Species of Woodsia

1. Stipes not jointed at base, their denuded remnants often long and, including rachises, of irregular lengths; blades glandular; indusia cuplike, cleft nearly to the base into broadly oblong to ovate toothed segments, long septate hairs wanting; frond and stipe glabrous or merely glutinous except for chaff on stipe..... W. obtusa
1. Stipes jointed near the base, the joint appearing as a slightly thickened and darkened ring; the persistent old bases of stipes of essentially uniform length, mostly 1-3 cm long; blades not glandular, 2
 2. Stipes and at least the lower third of the rachises brown, firm, often shaggy at base: rhizome scales sparingly fimbriate-ciliate; blades 2-3.5 cm wide: indusium a minute disk bearing 10-20 long, dark septate hairs on margin..... W. ilvensis
 2. Stipes and rachises green or stramineous, the latter without chaff, the former rarely chaffy above the joints; rhizome scales not fimbriate-ciliate; blades 8-14 mm wide; indusia with 5-8 hairs only slightly exceeding sporangia. W. glabella

Woodsia glabella R. Br. Smooth Woodsia.

Meaning of Species Name. Smooth.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Crests of shaded cliffs in thin moss or humus; usually on calcareous rocks.

Range. Nf to Ak, s to n NH, n Vt, Catskill mts of NY, Ont, and BC; also in Eurasia.

Distr in NYS. In 1924 House reported this species as being known only from Herkimer co.

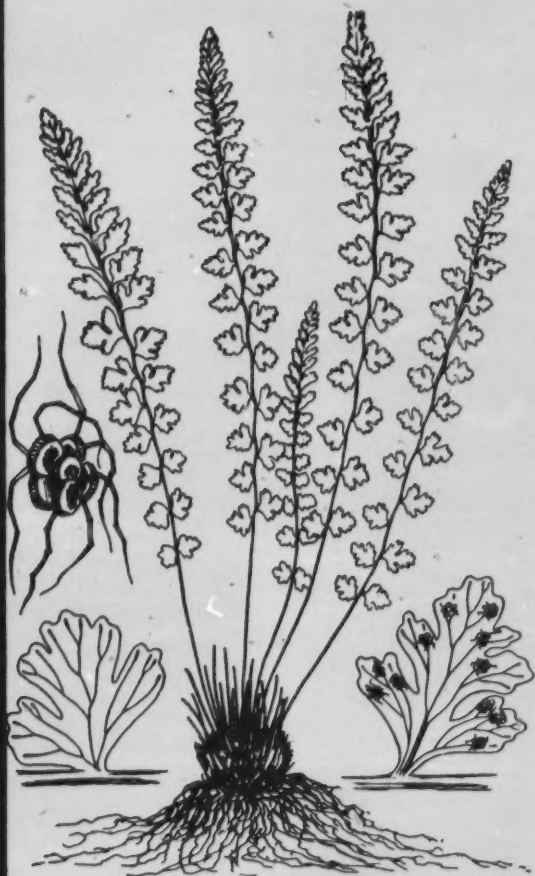
Distr in the Torrey Range. Not listed in Taylor (1915).

Time of Fr. Jul-Aug.

Origin. Native.

Growing in wooded country between 54° and 64° north latitude, this species was first discovered on a journey to the shores of the Polar Sea by Sir John Franklin between 1819 and 1822. Named in 1823, it was later found to be distributed in arctic and alpine Europe and Asia.

Two features, its diminutive size and subalpine distribution, have operated against general acquaintance with this plant in the northeastern



Woodsia glabella--Smooth Woodsia
[From Small (1935), p. 132.]



Woodsia ilvensis--Rusty Woodsia
[From Small (1935), p. 130.]

states. In fact, as reported by Small (1935), its occurrence in the state of New York was doubted or overlooked for many years. However, it is certain now that the fern was found many years ago in Greene County. In 1895 it was rediscovered at the same locality, and in 1921 collected there for the third time. Regarding the latest finding of this fern, the collector records that "In the latter part of August, 1921, ... I explored a deep ravine where sheer dripping cliffs with the talus extending almost to the bank of the stream formed an agreeable prospect. Here I found on the rocks the slender cliff-brake (Cryptogramma Stelleri).... Growing near the slender cliff-brake were bleached specimens of the long beech-fern (Thelypteris Phegopteris (L.) Slosson) and, almost concealed in the fissures, a small fern in some abundance at this particular spot, which I at first supposed might be Asplenium viride Huds. A glance at the textbooks and manuals, however, soon assured me that I had found the smooth Woodsia ..." at an altitude of about 2500 feet.

Woodsia ilvensis (L.) R. Br. Rusty Woodsia.

Meaning of Species Name. Of the Island of Elba, where this species is reported to have been first discovered.

Other Names. Fragrant Woodsia, Ray's Woodsia, Oblong Woodsia, Woodsia, Hairy Woodsia, Hair Fern.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Dry, mostly sterile rocks, cliffs, and talus, mostly in acid soil and frequently in exposed situations.

Range. Gl and Baffinland to Ak, s to Nf, NJ, Pa, upland to NC, Ill, Mich, Ia, Alta, and BC; also in Eurasia.

Distr in NYS. Frequent throughout the n. counties, the Adirondack and L Champlain reg (3000 ft alt), and southw in the Hudson valley to the Catskill mts; elsewhere local or rare.

Distr in the Torrey Range. NY: Reported but not definitely known from LI, unknown on SI, rare and local in Westchester and Rockland co, increasing northw.

Elevation. Grows to 5000 ft in NH, sea level-3900 ft in the Torrey range.

Time of Fr. Jun-Oct; Jun 10-Sep 15 at Cornell.

Origin. Native.

Woodsia obtusa (Spreng.) Torr. Blunt-lobed Woodsia.

Meaning of Species Name. Obtuse.

Type of Plant. A perennial herb, reproducing by spores.

Habitat. Shaded ledges, rocky woods, and dry wooded talus slopes.

Range. Me to Minn and Neb, s to Fla and Tex.

Distr in NYS. Frequent from L Champlain southw in the Hudson valley to Westchester co, rare or local on LI and SI, not reported from the Adirondack reg, and reported as rare and local in the Susquehanna and Chenango valleys and in w NY.

Distr in the Torrey Range. NY: Near Greenport, LI, rare on SI, thence increasing northw.

Elevation. Grows to 2200 ft in Va, sea level-4020 ft in the Torrey range.



Woodsia obtusa--Blunt-lobed Woodsia
 [From Billington (1952), Fig. 41, p. 146.]

Time of Fr. May-Oct; Jun 25-Jul at Cornell.

Origin. Native.

Remarks. Sometimes confused in the field with *Cystopteris fragilis*, but the scales borne along the rachis readily distinguish the *Woodsia*.

BIBLIOGRAPHY

- Adrosko, Rita J. 1971. Natural Dyes and Home Dyeing. Reprinted by Dover Publications, Inc., New York.
- Alexander, E. J. 1936. "An Unsought Adventure in the Southern Catskills," Jour. N. Y. Bot. Gard. 37: 42-46.
- Arehart-Treichel, Joan. 1976. "Don't Let Toxic Chemicals Go to Your Head," Science News, Vol. 109, No. 14, p. 221.
- Bailey, L[iberty] H. 1949. Manual of Cultivated Plants, Rev. Ed. Macmillan Publishing Co., Inc., New York.
- Bartram, William. 1792. Travels Through North and South Carolina, Georgia, East and West Florida. A facsimile of the 1792 London ed. The Beehive Press, Savannah, 1973.
- Berglund, Berndt, and Clare E. Bolsby. 1971. The Edible Wild. Charles Scribner's Sons, New York.
- Billington, Cecil. 1952. Ferns of Michigan. Cranbrook Institute of Science, Bloomfield Hills, Mich.
- Britton, Nathaniel Lord, and Addison Brown. 1913. An Illustrated Flora of the Northern United States, Canada and the British Possessions ... 2d ed. 3 vols. Charles Scribner's Sons, New York. Reprinted by Dover Publications, Inc., New York.
- Brooker, S. G., and R. C. Cooper. 1961. "New Zealand Medicinal Plants," Econ. Bot. 15: 1-10.
- Brooklyn Botanic Garden. 1964. Dye Plants and Dyeing. A special printing of Plants & Gardens, Vol. 20, No. 4. Brooklyn Botanic Garden, Brooklyn.
- Brooks, Karl L. 1956. "Notes on the Pteridophytes of Delaware County, New York," Am. Fern Jour. 46: 109-121.
- _____. "New Records for Delaware County, New York," Torreya 89(3): 190-191, May-June 1962.
- _____. 1977. The Catskill Flora: A Check List. Privately Xeroxed.
- _____. 1978. A Check List of the Flora of Delaware County, New York. Privately Xeroxed.
- Buchheister, J. C. 1903. "Notes from the Catskills [Griffins Corners, N. Y.]," The Fern Bul. 11: 15-16.
- Burnham, Stewart H. 1914. "Braun's Holly Fern," Am. Fern Jour 4: 1-5.

- Clark, Thomas H., and Colin W. Stearn. 1960. The Geological Evolution of North America. The Ronald Press Co., New York.
- Cleveland, George T. 1908. "Ferns of the Upper Susquehanna Valley," Fern Bul. 16: 101-103.
- Clute, Willard N. 1898. The Flora of the Upper Susquehanna and Its Tributaries. Willard N. Clute & Co., Binghamton, N. Y.
- _____. 1905. The Fern Allies of North America North of Mexico. Frederick A. Stokes Co., New York. (A second edition was published in 1928.)
- _____. 1938. Our Ferns: Their Haunts, Habits and Folklore. 2d ed. J. B. Lippincott Co., New York.
- Coon, Nelson. 1960. Using Wayside Plants. 3rd rev. ed. Hearthside Press Inc., New York.
- Core, Earl L. 1967. "Ethnobotany of the Southern Appalachian Aborigines," Econ. Bot. 21: 199-214.
- Crockett, Lawrence J. 1977. Wildly Successful Plants: A Handbook of North American Weeds. Macmillan Publishing Co., Inc., New York.
- Dalgity, Anna C. 1907. "The Common Brake as Food," Fern Bul. 15: 41-43.
- Densmore, Frances. 1928. "Uses of Plants by the Chippewa Indians," 44th Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1926-1927, pp. 279-397. U.S. Government Printing Office, Washington, D. C. Reprinted as How Indians Use Wild Plants by Dover Publications, Inc., New York, 1974.
- "Destroying the Ferns," Fern Bul. 12: 55-57, 1904.
- Dispensatory of the United States of America. 1865. J. B. Lippincott & Co., Philadelphia. 12th ed.
- Dowell, Philip. 1910. "Notes on Some Ferns Found During 1909," Am. Fern Jour. 1: 12-14.
- Encyclopaedia Britannica. 1957. 24 vols. Encyclopaedia Britannica, Inc., Chicago.
- Everett, T. H., ed. 1960. New Illustrated Encyclopedia of Gardening, Unabridged. 14 vols. Greystone Press, New York.
- Evers, Alf. 1972. The Catskills from Wilderness to Woodstock. Doubleday & Co., Inc., Garden City, N. Y.
- Fenneman, Nevin M. 1938. Physiography of Eastern United States. McGraw-Hill Book Co., New York.
- Fernald, Merrit L. 1950. Gray's Manual of Botany. 8th ed. American Book Co., New York.

- Fernald, Merritt L., and Alfred C. Kinsey. 1943. *Edible Wild Plants of Eastern North America*. Idlewild Press, Cornwall-on-Hudson, N. Y. (An edition revised in 1958 by Reed C. Rollins is available from Harper & Row, New York.)
- Georgia, Ada E. 1914. *A Manual of Weeds*. The Macmillan Co., New York.
- Gibbons, Euell. 1962. *Stalking the Wild Asparagus*. David McKay Co., Inc., New York.
- . 1966. *Stalking the Healthful Herbs*. David McKay Co., Inc., New York.
- Gilbert, B. D. 1903. "The Fern Flora of New York," *The Fern Bul.* 11: 97-105.
- Gleason, Henry A. 1952. *The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada*. 3 vols. The New York Botanical Garden, New York.
- Grieve, M. 1967. *A Modern Herbal*. 2 vols. Hafner Publishing Co., New York.
- Hall, Isaac H. 1874. "Catskill Ferns," *Bul. Torr. Bot. Club* 5: 38-39.
- Hedrick, U. P., ed. 1919. *Sturtevant's Edible Plants of the World*. Dover Publications, Inc., New York, 1972.
- House, Homer D. 1924. *Annotated List of the Ferns and Flowering Plants of New York State*. New York State Museum Bul. No. 254.
- J. H. R. 1875. "*Aspidium aculeatum*, Sw., var. *Braunii* Koch," *Bul. Torr. Bot. Club* 6: 331.
- Johnson, C. Pierpoint. [1867.] *The Useful Plants of Great Britain*. Robert Hardwicke, London.
- Johnston, Alex. 1970. "Blackfoot Utilization of the Flora of the Northwestern Great Plains," *Econ. Bot.* 24: 301-324.
- Kingsbury, John M. 1964. *Poisonous Plants of the United States and Canada*. Prentice-Hall, Englewood Cliffs, N. J.
- Knobloch, Irving W. 1971. "Asiatic Indian Remedies," *Am. Fern Soc. News and Views*, No. 4, Oct.
- Kobbe, F. Wm. 1926. "The Smooth *Woodsia* in New York," *Am. Fern Jour.* 16: 29-31.
- Krochmal, Arnold. 1968. "Medicinal Plants in Appalachia," *Econ. Bot.* 22: 332-337.

- Krochmal, Arnold, and Connie Krochmal. 1973. A Guide to the Medicinal Plants of the United States. Quadrangle, the New York Times Book Co., New York.
- _____, Russell S. Walters, and Richard M. Doughty. 1971. A Guide to Medicinal Plants of Appalachia. Agriculture Handbook No. 400, Forest Service, U. S. Department of Agriculture.
- Kudish, Michael. 1971. Vegetational History of the Catskill High Peaks. University Microfilms, Ann Arbor, Mich.
- Lawrence, George H. M. 1951. Taxonomy of Vascular Plants. The Macmillan Co., New York.
- Lebentritt, Julia. 1974. "Fiddleheading: A Spring Harvest of Ferns and Fun," Vermont Life 28: 20-23, Spring 1974.
- Li, Hui-Lin. 1969. "The Vegetables of Ancient China," Econ. Bot. 23: 253-260.
- Lighthall, J. I. [n.d.] The Indian Folk Medicine Guide. Popular Library, New York.
- McVaugh, Rogers. 1958. Flora of the Columbia County Area, New York. New York State Museum and Science Service Bul. No. 360.
- Martin, Alexander C., Herbert S. Zim, and Arnold L. Nelson. 1961. American Wildlife and Plants. Dover Publications, Inc., New York.
- Medsger, Oliver P. 1917. "Two Months in the Southern Catskills," Mem. Torr. Bot. Club 17: 294-300.
- _____. 1927. [Flora of the Catskills--Abstract of a lecture before the Torrey Botanical Club 9 Nov 26,] Torreya 27: 13-14.
- _____. 1947. Edible Wild Plants. The Macmillan Co., New York.
- Milde, Julius. 1865. Monographia Equisetorum. E. Blochmann & Sohn, Dresden.
- Millspaugh, Charles F. 1887. American Medicinal Plants ... Boericke & Tafel, New York. (The 1892 ed. of this work is available from Dover Publications, Inc., New York.)
- Montgomery, James D. 1978. "A Vegetative Key to the Ferns of the Northeastern United States," Fiddlehead Forum, Vol. 5, No. 3, pp. 3-4 (May-June).
- Muenschner, Walter C. 1949. Poisonous Plants of the United States. The Macmillan Co., New York.
- _____. 1952. Weeds. The Macmillan Co., New York.

- Parker, Arthur C. 1910. Iroquois Uses of Maise and Other Food Plants. New York State Museum Bul. No. 482. Albany, N. Y.
- Perkins, Anne E. 1930. "Common Plants as Domestic Remedies in Maine," *Torreya* 30: 63-68.
- Platt, M. 1840. "Plants Collected and Examined by the Botanic Class ... During the Summer Term of 1840," Fifty-fourth Annual Report of the Regents of The University of the State of New York, 227-231, 1841.
- Proctor, George R. 1947. "Some Noteworthy Catskill Plants," *Rhodora* 49: 53-54.
- Puri, H. S. 1970. "Indian Pteridophytes Used in Folk Remedies," *Am. Fern Jour.* 60: 137-143.
- Rafinesque, C[onstantine] S[amuel]. 1828-30. Medical Flora ... of the United States ... 2 vols. Atkinson & Alexander, Philadelphia.
- Rich, John L. 1935. Glacial Geology of the Catskills. New York State Museum Bul. No. 299. Albany, N. Y.
- "The Scouring Rush Along the Mississippi," *Fern Bul.* 13: 85-86, 1905.
- Shaver, Jesse M. 1954. Ferns of Tennessee. George Peabody College for Teachers, Nashville, Tenn. Reprinted in 1970 by Dover Publications, Inc. as Ferns of the Eastern Central States.
- Small, John K. 1893. "The Altitudinal Distribution of the Ferns of the Appalachian Mountain System," *Bul. Torr. Bot. Club* 20: 455-467.
- _____. 1935. Ferns of the Vicinity of New York. The Science Press, Lancaster, Pa.
- Smith, J. Russell. 1925. North America. Harcourt, Brace & Co., New York.
- Steyermark, Julian A. 1963. Flora of Missouri. Iowa State University Press, Ames, Ia.
- Stone, Hugh E. 1945. A Flora of Chester County Pennsylvania. 2 vols. The Academy of Natural Sciences, Philadelphia.
- Sturtevant, Edward L. 1919. See Hedrick, U. P. 1919.
- Svenson, H. K. 1931. "Trip of August 22-29," *Torreya* 31: 154-157.
- Taylor, Norman. 1909. "The Botanical Symposium at Stamford, Delaware County, July 3-10, 1909," *Torreya* 9: 188-189.
- _____. 1915. Flora of the Vicinity of New York: A Contribution to Plant Geography. Memoirs of the New York Botanical Garden. Vol V.
- "\$30,000 Paid Fern Pickers," *Am. Fern Jour.* 4: 28-29, 1914.

- Torrey, Raymond H. 1930a. "Columbus Day Week-End in the Catskills," *Torrey* 30: 24-25.
- _____. 1931b. "Catskill Trip, May 30-31," *Torrey* 31: 121-123.
- U.S. Department of Agriculture, Agricultural Research Service. 1971. *Common Weeds of the United States*. Dover Publications, Inc., New York.
- Usher, George. 1966. *A Dictionary of Botany*. Constable & Co., Ltd., London.
- Vaucher, J[ean] P. 1822. *Monographie des Prêles*. J. J. Paschoud, Geneve.
- Vogel, Virgil J. 1970. *American Indian Medicine*. Ballantine Books, New York.
- Webster's Seventh New Collegiate Dictionary. 1965. G. & C. Merriam Co., Springfield, Mass.
- Wherry, Edgar T. 1961. *The Fern Guide*. Doubleday & Co., Inc., Garden City, N. Y.
- Wiegand, Karl M., and Arthur J. Eames. 1925. *The Flora of the Cayuga Lake Basin, New York. Vascular Plants*. Cornell University Agricultural Experiment Station. Memoir 92.
- Weiner, Michael A. 1972. *Earth Medicine--Earth Foods: Plant Remedies, Drugs, and Natural Foods of the North American Indians*. The Macmillan Co., New York.
- Wiley, Farida. 1936. "Catskills Trip, September 12-14," *Torrey* 36: 152-154.
- _____, ed. 1951. *John Burrough's America*. The Natural History Library, Anchor Books, Doubleday & Co., Inc., Garden City, N. Y.

APPENDIX

To collect specimens of the more than 1000 plants growing in each of the several townships in the Catskills would not only entail an enormous amount of work but would at the same time clutter up the herbarium with hundreds of specimens of very common plants. Taking a cue from the work of Homer D. House and Stanley J. Smith, both of whom have supplemented collections with observations in compiling distribution records for the State of New York, the writer for many years has made an effort to collect one specimen of each plant growing in the Catskills, supplementing these records with observations made in the field, listing all specimens identified at each locality on any given date.

The fly in this ointment, of course, is that the observer must know what he is looking at. When not sure of the identity of any given plant in the field, a specimen was collected to key out at home. In due course, these field observations were listed in sequence by place and date, then transferred to 4-by-6-inch file cards under the name of the species, eliminating duplicate observations made on previous visits at or near the same place. These records are supplemented by a picture file, both of colored slides and of black-and-white photographs, built up over the years. The result totals thousands of records from each county in the Catskills, many from different places in the same township. It was therefore necessary to devise some method to reduce the bulk of these records while still giving a fairly comprehensive view of the distribution of the various species in the Catskills.

Some scientific studies of plant distribution are made on grid plots of equal size and shape. While not strictly accurate from the scientific point of view, perhaps, the township boundaries in each county do effectively break up the area into a grid. Following a device used by a number of other writers faced with a similar problem, the writer therefore decided to use the township grid as a basis for the distribution maps that follow; the selection of records was based on the following criteria:

1. All specimens collected in the Catskills have been listed, even when two or more came from the same township.
2. All known references in the literature have been included.
3. In the absence of specimens, with few exceptions, only the earliest observation for each township is given, regardless of the number of observations at hand for that area.
4. Records are arranged in chronological sequence by county.
5. In selecting the records for each township, collections take precedence; when no collection records are available, photographs take precedence over observations as representing more objective evidence of the occurrence of the species in that area.
6. Owing to the uncertain status of species on the Platt list, subsequent records for the Town of Franklin in Delaware County are also listed as confirmation of the fact that the species occurs in that township.

On the distribution maps that follow, a solid dot (●) represents a collection made in that township, while an open circle (○) represents an observation, a reference in the literature, or a photograph taken by the writer, with "T" indicating a transparency in color and "BW" a black-and-white picture. No effort has been made to show the approximate location within the township of collections or observations; the solid dots and open circles simply indicate the occurrence of that taxon somewhere within the township.

In most instances a specimen has been collected as conclusive evidence that a particular species occurs in each county. Specimens of all critical taxa collected by the writer have been checked by the late Stanley J. Smith ("SJS" in the records that follow), curator of botany at the New York State Museum in Albany, and specimens have been deposited with that institution.

Herbaria where specimens from the Catskill region are filed are indicated in the distribution records as follows: (BKL) Brooklyn Botanic Garden; (Brooks) herbarium of the writer; (CU) Cornell University; (MIN) University of Minnesota; (NY) New York Botanical Garden; (NYS) New York State Museum; (O) Ohio State University; (PENN) University of Pennsylvania; (Phil) Philadelphia Academy of Science; (US) U.S. National Herbarium.

The eventual aim is to secure at least one specimen or an observation of each species occurring in each of the several townships comprising the Catskill region--an almost never-ending task. But from these records one can easily compile a check list for any particular township. It is hoped that such information may stimulate further research and add to our knowledge of the local distribution of plants in this area. During the last century it was the fashion among amateur botanists to compile floras or check lists for their local townships, work that contributed to a more intimate knowledge of the plants growing in the area covered. There is still need for such studies. In addition to extending our scientific knowledge concerning the distribution of plants, such a project will not only result in a deeper understanding of the natural world but also provide many hours of intense satisfaction.



Counties and townships of the Catskill mountain region.

Equisetum arvense L.
Field Horsetail

Flora of
THE CATSKILLS
New York State



Delaware County

Gregorytown, Town of Colchester

1 Brooks 1939; frag. specimen destroyed after verification by SJS

Cameron Farm, 6 mi nw of Andes, Town of Delhi

KLB obs 29 May 52

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

1639 Brooks 10 Jul 52--Brooks; 2285 Brooks 15 May 53--Brooks

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Davenport Center, Town of Davenport

Smith & Brooks obs 7 Aug 54

1 1/2 mi sw of Odell L, Town of Harpersfield

KLB obs 2 Jul 55

1 mi s of Cadosia, Town of Hancock

18998 S. J. Smith and Wilcox 10 Aug 55--NYS

Vly Creek, 1 mi n of Fleischmanns, Town of Middletown

4956 Brooks 23 May 70--NYS

Equisetum arvense

Rosa Farm, 1 mi s of Margaretville, Town of Middletown
5061 Brooks 11 Jul 71--NYS; 5089 Brooks 18 Jun 72--NYS
Big Pond Rd, 14 mi s by e of Andes, Town of Andes
KLB obs 6 Jun 73
3 mi s of Grand Gorge, Town of Roxbury
KLB obs 19 Jun 73
1 1/2 mi sw of Bovina Center, Town of Bovina
KLB obs 7 Jul 73
2 1/2 mi e by n of Delancey, Town of Hamden
KLB obs 14 Jul 73
3 mi s of Walton, Town of Walton
KLB obs 29 Jun 75
East Meredith, Town of Meredith
KLB obs 1 Aug 75
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 4 Aug 75
Vic of Silver L, Town of Deposit
KLB obs 31 Aug 75
1 1/2 mi w of Loomis, Town of Tompkins
KLB obs 7 Sep 75

Greene County

Onteora, Town of Hunter
Anna M. Vail [1891]--NY
Deep Notch, s of West Kill, Town of Lexington
SJS obs 15 Jun 56
Prattsville, Town of Prattsville
KLB obs 19 Jun 73
2 mi n of Halcott Center, Town of Halcott
KLB obs 25 Jun 73
2 mi s of Jewett, Town of Jewett
KLB obs 1 Jul 75
2 mi n of Windham, Town of Windham
KLB obs 21 Jul 75
Vic of E. Ashland, Town of Ashland
KLB obs 14 Sep 75

Schoharie County

Vic of W. Conesville, Town of Conesville
KLB obs 1 Jul 75
Vic of S. Gilboa, Town of Gilboa
KLB obs 22 Sep 75

Sullivan County

N of N. Branch, Town of Callicoon
SJS obs 20-22 Jun 56

(Continued on p. 161)

Equisetum fluviatile L.
Water Horsetail

Flora of
THE CATSKILLS
New York State



Delaware County

North Franklin, Town of Franklin

4746 Brooks 28 May 67--NYS, Brooks

Rosa Farm, 1 mi s of Margaretville, Town of Middletown

4961 Brooks 13 Jun 70--NYS; 4965 Brooks 27 Jun 70--NYS, Brooks;

5086 Brooks 4 Jun 72--NYS

Vic of Fishs Eddy, Town of Hancock

KLB & Phil Caswell obs 14 Sep 78

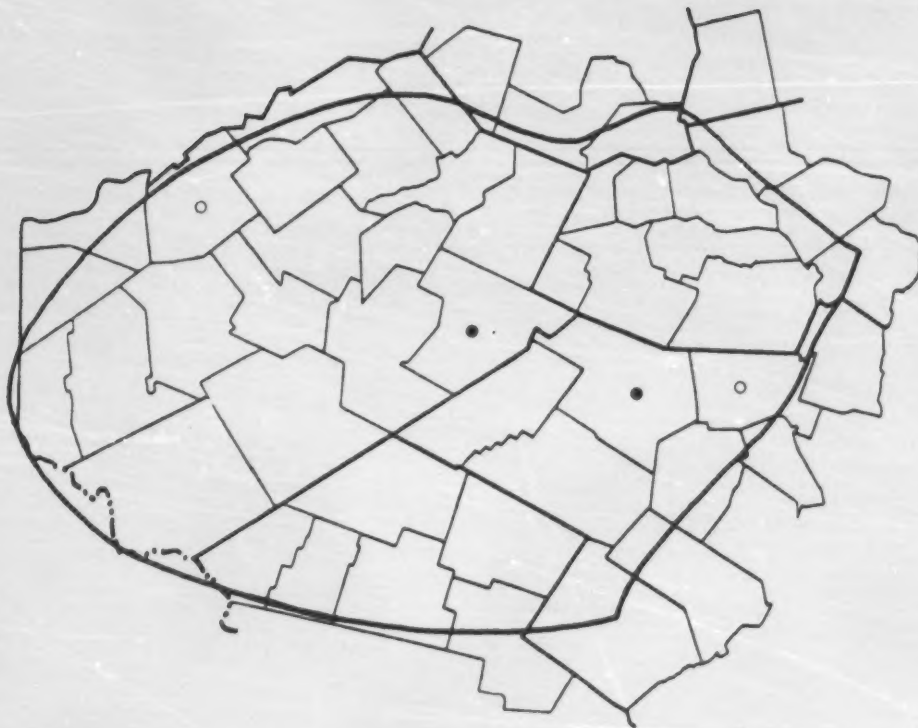
Greene County

Peach L, Catskills

6417 M. S. Baxter 17 Aug 26--Baxter

Equisetum hyemale L.
ssp. *affine* (Engelm.) Stone
Winter Scouring Rush

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Old Stone Schoolhouse, 2 1/2 mi sw of Margaretville, Town of Middletown

5011 Brooks 30 May 71--NYS, Brooks

Ulster County

Shandaken, Town of Shandaken

Mary F. Miller 11 Sep 1898--PENN (this specimen was labeled *E. laevigatum*, but Stanley Smith was of the opinion that it was an aberrant form of *E. hyemale affine*); 231 Miller 31 Aug 02--NYS

Mt Tremper, Town of Shandaken

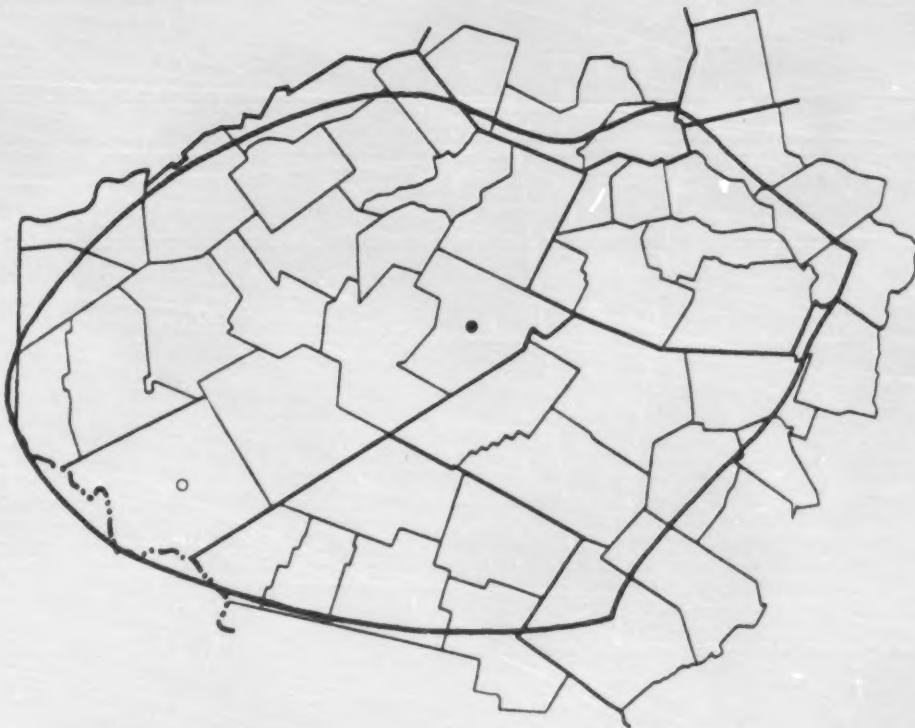
4962 Brooks & Mary Domville 21 Jun 70--NYS, Brooks

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Equisetum x litorale Kuhl.
(*E. fluviatile* x *E. arvense*)
Shore Horsetail

Flora of
THE CATSKILLS
New York State



Delaware County

1 mi w of Cadosia, Town of Hancock

SJS obs 10 Aug 55

Rose Farm, 1 mi s of Margaretville, Town of Middletown

4909 Brooks 21 Jun 69--NYS; 4966 Brooks 27 Jun 70--Brooks, NYS

Equisetum sylvaticum L.
Wood Horsetail

Flora of
THE CATSKILLS
New York State



Delaware County

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
859 Brooks 26 Aug 51--NYS; 1543 Brooks 14 Jun 52--NYS, Brooks;
2036 Brooks 16 May 53--Brooks
Bullet Hollow Rd, 4 1/2 mi nw of Andes, Town of Delhi
1958 Brooks 17 Aug 52--NYS
Walling Place, Vly Creek, 1 mi n of Fleischmanns, Town of Middletown
5000 Brooks 22 May 71--NYS
Rathbone Hill Rd, 2 mi sw of Davenport Center, Town of Davenport
KLB, Kathy Emerson, & Phil Caswell obs 23 Aug 78
Vic of Gregorytown, Town of Colchester
KLB, Kathy Emerson, & Phil Caswell obs 30 Aug 78

Sullivan County

Liberty, Town of Liberty
4626 E. Whitney 30 Jul 35--NYS

Equisetum sylvaticum

E side of Long Eddy, Town of Fremont

SJS obs 7 Sep 56

1 mi s of Lew Beach, Town of Rockland

5178 Brooks 3 Jun 74--NYS

Ulster County

Bull Run, vic of Denning, Town of Denning

3515 C. J. Elting 25 May 1899--NYS

2 mi e of Turnwood, Town of Hardenburgh

KLB obs 31 May 76

3 mi nw of Tabasco, Town of Rochester

KLB & Paul Huth obs 19 Aug 76

Equisetum arvense (continued from p. 156)

S side of Rondout Reservoir, Town of Neversink

SJS obs 22 Jun 56

Between Hankins & Long Eddy, Town of Fremont

SJS obs 8 Sep 56

1 mi s of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

3 mi n of Woodbourne, Town of Fallsburg

KLB obs 2 Aug 76

Ulster County

S side of Bushnellsville, Town of Shandaken

SJS obs 12 Aug 61

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Vic of Hardenburgh, Town of Hardenburgh

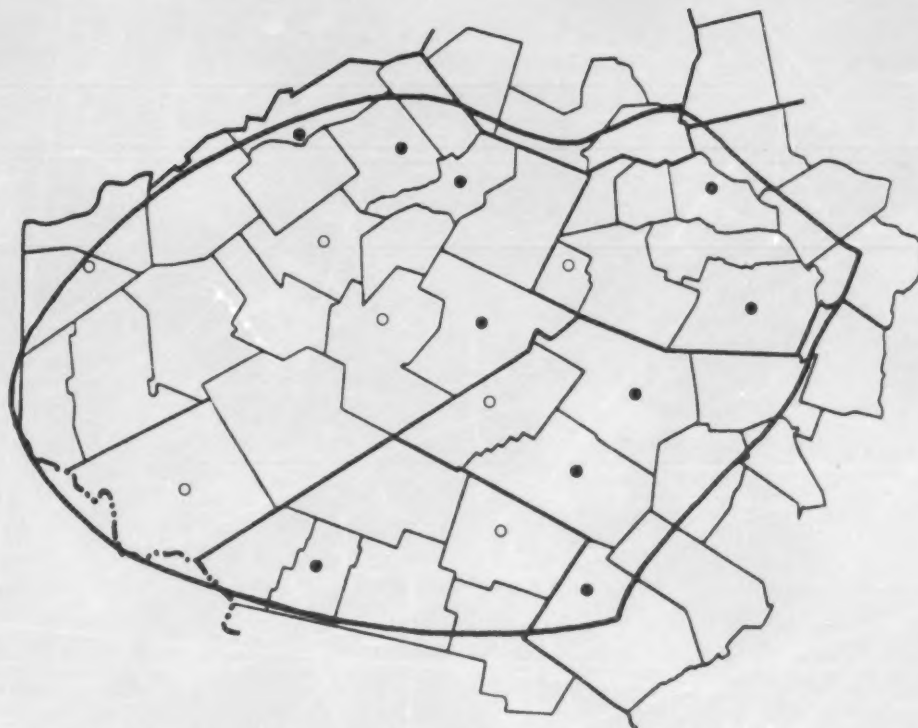
KLB obs 14 May 74

Vic of Frost Valley Camp, Town of Denning

KLB obs 11 Jun 74

Lycopodium annotinum L.
ssp. *annotinum*
Bristly Clubmoss

Flora of
THE CATSKILLS
New York State



Delaware County

Stamford, Town of Stamford

N. Taylor 3-10 Jul 09--NY

Arkville, Town of Middletown

F. Mulford & P. Wilson 29-31 May 15--NY; P. Wilson 5 Jul 15--NY

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 86, 1924.

S of Davenport, Town of Davenport

5035 E. Whitney 17 Jun 36--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

2278 Brooks 15 May 53--Brooks, NYS

N of Lordville, Town of Hancock

SJS obs 18 Jun 54

Scotch Mt, 3 1/2 mi ne of Delancey, Town of Delhi

KLB obs 12 Jul 54

Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

Lycopodium annotinum ssp. *annotinum*

Greene County

Tannersville, Town of Hunter
Anna M. Vail 17 Jul 1891--NY
Onteora, Town of Hunter
Anna M. Vail 17 Jul 1891--NY
Kaaterskill Mt Rd, Town of Hunter
Rudolf Ringe 5 Sep 1891--NY
Twilight Park, Town of Hunter
G. Schull 8 Jun 03--US
Maplecrest, Town of Windham
Alexandra Dodd 10 Jul 27--NY
Vic of Haines Falls, Town of Hunter
R. H. Torrey obs above 3000 ft in Torreya 30: 24-25, 1930.
N slope of Hunter Mt, Town of Hunter
4588 H. K. Svenson at 3800 ft 24 Aug 31--BKL
Steinfeld Place, 3 mi n of Halcott Center, Town of Halcott
KLB obs 26 Jul 75

Sullivan County

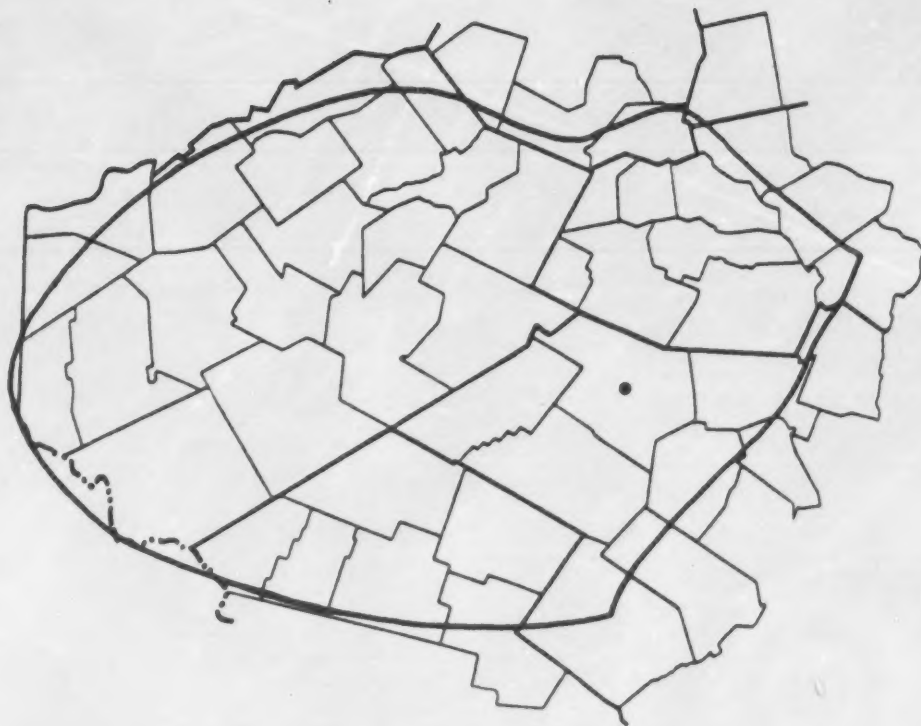
L Shandeelee, Town of Callicoon
P. Wilson 15 Aug 18--NY
Se of Willowemoc, Town of Neversink
SJS obs 15 Aug 52

Ulster County

Shandaken, Town of Shandaken
244 Miller 12 Aug 03--NYS
Bushnellsville, Town of Shandaken
M. S. Miller 11 Sep 03--US
Slide Mt, Town of Shandaken
6708 M. S. Baxter 6 Aug 26--Baxter
Red Hill at Denning, Town of Denning
E. J. Alexander 8 Nov 27--NY
Town of Denning
256 H. Dunbar 11 Aug 53--NYS
Dry Brook valley, Town of Hardenburgh
H. Dunbar obs May 59
South Hill Rd, n of Ulster Heights, Town of Warwarsing
693 M. Domville 11 Jul 70--NYS

Lycopodium annotinum L.
ssp. *pungens* (LaPylaie) Hult.

Flora of
THE CATSKILLS
New York State

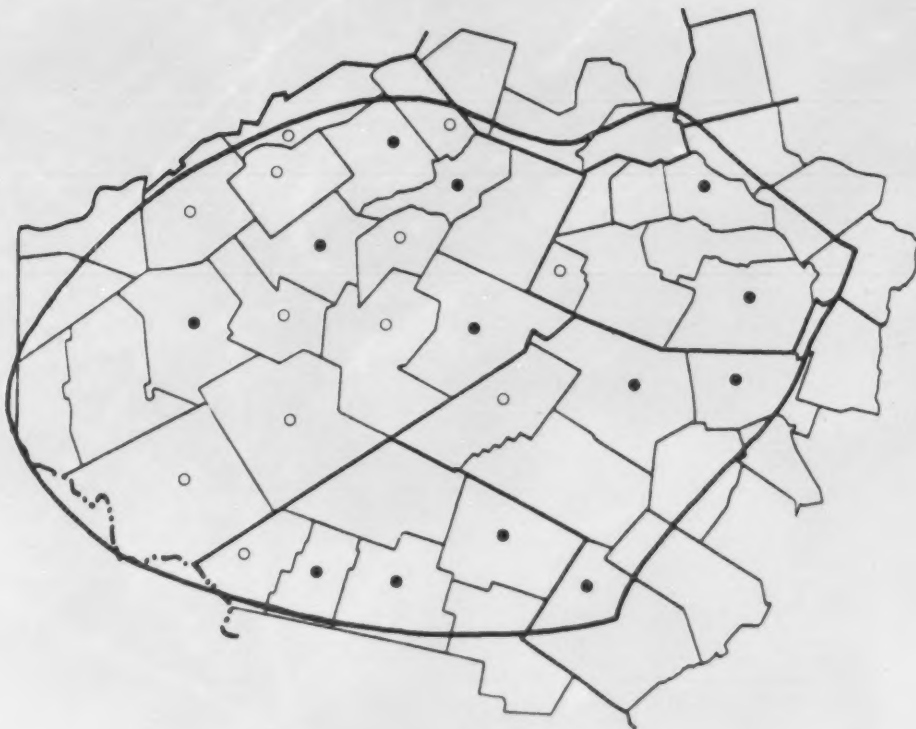


Ulster County

Shandaken, Town of Shandaken
243 Miller 11 Sep 03--NYS

Lycopodium clavatum L.
Staghorn Clubmoss

Flora of
THE CATSKILLS
New York State



Delaware County

Stamford at 2300 ft, Town of Stamford
N. Taylor 3-10 Jul 09--NY
Arkville, Town of Middletown
E. N. Harvey--NY; P. Wilson 3 Jul 15 & 16 Jul 15--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 86, 1924 (var. megastachyon).
Delhi, Town of Delhi
2047 N. Hotchkiss 10 May 27--NYS
Walton, Town of Walton
H. M. Denslow 8 Jul 27--NY
Bear Spring Mt, vic of Walton, Town of Walton
4525 E. Whitney 27 Jul 35--NYS
Cameron Farm, 6 mi nw of Andes, Town of Delhi
384 Brooks 27 Jun 51--NYS
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
304 Brooks 24 Jun 51--Brooks, NYS; 616 Brooks 23 Jul 51--NYS;
861 Brooks 26 Aug 51--Brooks

Lycopodium clavatum

N of Lordville, Town of Hancock

SJS obs 18 Jun 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

4 mi se of Downsville, Town of Colchester

KLB obs 12 Jun 73

Gregory Hollow Rd, 4 mi s by e of Delancey, Town of Hamden

KLB obs 11 May 75

Storey Place, 6 mi se of Framklin, Town of Franklin

KLB obs 20 Jun 76

2 mi e of Meridale, Town of Meredith

KLB obs 19 Sep 76

Vic of Emmons Bog, Town of Davenport

KLB, Kathy Emerson, & Phil Caswell obs 23 Aug 78

Greene County

Big Hollow [Maplecrest], Town of Windham

2380 Barnhart at 2000 ft [n.d.]--NYS

Haines Falls, Town of Hunter

Lighthipe [n.d.]--BKL

Tannersville, Town of Hunter

Anna M. Vail 13 Jul 1891--NY

Onteora, Town of Hunter

Anna M. Vail 13 Jul 1891--NY

Hunter Mt, Town of Hunter

E. A. Mearns 27 Aug 1896--NY

Lanesville, Town of Hunter

H. M. Denslow 11 Aug 19--NY

Vic of Haines Falls above 3000 ft, Town of Hunter

R. H. Torrey obs in *Torreya* 30: 24-25, 1930

Steinfeld Place, 3 mi n of Halcott Center, Town of Halcott

KLB obs 26 Jul 75

Sullivan County

L Willowemoc, Town of Neversink

L. M. Underwood 1875--NY

L Shandeelee, Town of Callicoon

P. Wilson 10 Aug 18--NY

Liberty, Town of Liberty

4623 E. Whitney 30 Jul 35--NYS

Between Parksville & Liberty, Town of Liberty

6777 S. J. Smith & Bascom 15 Jun 50--NYS

Vic of Tennansh L, Town of Fremont

KLB obs 19 Jul 76

(Continued on p. 169)

Lycopodium complanatum L.
ssp. *flabelliforme* (Fern.) Clausen
Trailing Ground-pine

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin
M. Platt, 1840
Deposit, Town of Deposit
F. Mulford 6 Aug 03--BKL (labeled var. elongatum)
Arkville, Town of Middletown
E. N. Harvey--NY; P. Wilson 6 Jul 15--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 86, 1924.
Delhi, Town of Delhi
2048 N. Hotchkiss 10 May 27--NYS
Houghtaling Hollow, n of Delhi, Town of Delhi
4477 E. Whitney 26 Jul 35--NYS
S of Davenport, Town of Davenport
5023 E. Whitney 17 Jun 36--NYS
The Vlai on Franklin Mt, s of Oneonta, Town of Franklin
5139 McVaugh & Curtis--CU
Cameron Farm, 6 mi nw of Andes, Town of Delhi
385 Brooks 27 Jun 51--NYS; 396 Brooks 27 Jun 51--NYS

Lycopodium complanatum ssp. *flabelliforme*

2 mi s of Grand Gorge, Town of Roxbury
Smith & Brooks obs 12 May 51
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
615 Brooks 23 Jul 51--NYS, Brooks; 447 Brooks 8 Jul 51--NYS
N of Lordville, Town of Hancock
SJS obs 18 Jun 54
Hoff Farm, 2 1/4 mi nw of Bovine Center, Town of Bovina
KLB obs 14 Jul 54
1 mi w of Odell L, Town of Harpersfield
KLB obs 2 Jul 55
4 mi se of Downsville, Town of Colchester
KLB obs 12 Jun 73
Roses Brook Rd, 3 mi se of S. Kortright, Town of Stamford
KLB obs 16 May 74
Vic of Launt Pond, Town of Walton
KLB obs 28 Jul 74
Basin Clove Rd, 1 1/2 mi s by e of Delancey, Town of Hamden
KLB obs 11 May 75
Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville
KLB obs 7 Sep 75
4 mi sw of Trout Creek, Town of Deposit
KLB obs 7 Sep 75
2 mi w of Meredith, Town of Meredith
KLB obs 19 Sep 76

Greene County

Big Hollow [Maplecrest], Town of Windham
2314 Barnhart at 2300 ft [n.d.]--NY
Onteora, Town of Hunter
Anna M. Vail 6 Oct 1891--NY
Tannersville, Town of Hunter
277 N. Taylor 1 Jun 09--NY
Windham, Town of Windham
1039 N. Taylor 2 Aug 09 at 1700 ft--NY
Vic of Haines Falls, Town of Hunter
R. H. Torrey obs above 3000 ft in *Torreya* 30: 24-25, 1930.
Brunner Place, 4 mi n of Halcott Center, Town of Halcott
KLB obs 9 Jun 75

Sullivan County

L Shandelea, Town of Callicoon
P. Wilson 11 Aug 18 & 23 Aug 18--NY
Vic of Liberty, Town of Liberty
4615 & 4622 E. Whitney 30 Jul 35--NYS
Between Parksville & Liberty, Town of Liberty
6778 S. J. Smith & Bascom 15 Jun 50--NYS
Fir Brook Swamp, ne of Willowemoc, Town of Neversink
8253 S. J. Smith & Bascom 5 Oct 50--NYS

Lycopodium complanatum ssp. *flabelliforme*

Ulster County

Vic of Pine Hill, Town of Shandaken

F. M. Hexamer 28 Aug 1884--NY

Bushnellsville, Town of Shandaken

M. F. Miller 6 Sep 1898--PENN

Shandaken, Town of Shandaken

249 Miller 1 Sep 03--NYS

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

889 M. Domville 6 Sep 70--Domville

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

3 mi nw of Tabasco, Town of Rochester

KLB & Paul Huth obs 19 Aug 76

Lycopodium clavatum (continued from p. 166)

Ulster County

Bushnellsville, Town of Shandaken

M. F. Miller 6 Sep 1898--PENN

Shandaken, Town of Shandaken

246 Miller 6 Sep 02--NYS

South Hill Rd, n of Ulster Heights, Town of Warwarsing

692 M. Domville 11 Jul 70--Domville

Meads Meadow, Town of Woodstock

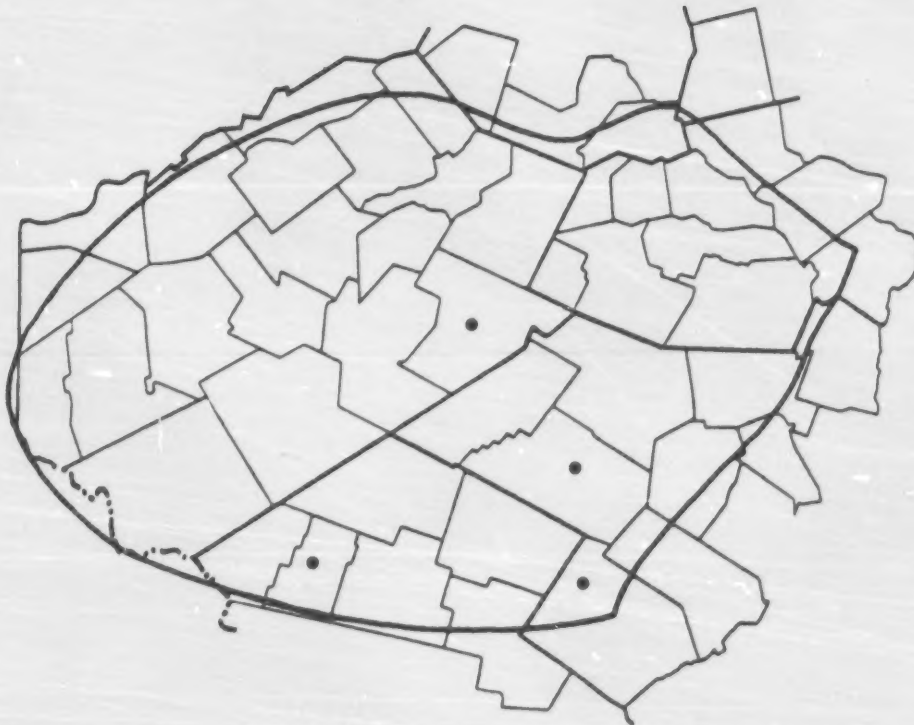
1048 M. Domville 15 Jun 71--Domville

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

Lycopodium inundatum L.
Bog Clubmoss

Flora of
THE CATSKILLS
New York State



Delaware County

Rosa Farm, 1 mi s of Margaretville, Town of Middletown
4924 Brooks 25 Aug 69--Brooks, NYS

Sullivan County

L Shandelelee, Town of Callicoon
P. Wilson 26 Aug 18--NY

Ulster County

E branch of Sugarloaf Brook, vic of Denning, Town of Denning
E. J. Alexander 8 Nov 27--NY
Vic of Round Pond, Town of Denning
G. L. Stebbins et al. 23 Jun 34--NYS
Town of Warwarsing
H. Dunbar at 2000 ft Aug 50--NYS
Denning, Town of Denning
250 H. Dunbar 11 Aug 53--NYS

Lycopodium lucidulum Michx.
Shining Clubmoss

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown
E. M. Harvey--NY; F. Mulford 6 Sep 08--BKL; E. B. Southwick Sep 10--
BKL; F. Mulford & P. Wilson 29-31 May 15--BKL; P. Wilson 3 & 10 Jul
15--NY

Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 86, 1924.

Delhi, Town of Delhi
2049 N. Hotchkiss 10 May 27--NYS

Tompkins, Town of Tompkins
H. M. Denslow 8 Jul 27--NY

Roxbury, Town of Roxbury
3451 E. Whitney 9 Jun 33--NYS

Gould School, Town of Hancock
3493 E. Whitney 12 Jun 33--NYS

Hawley's, vic of Hamden, Town of Hamden
4501 E. Whitney 26 Jul 35--NYS

S of Davenport, Town of Davenport
5002 & 5025 E. Whitney 17 Jun 36--NYS

Lycopodium lucidulum

Vic of Masonville, Town of Masonville

5112 E. Whitney 19 Jun 36--NYS

Bullet Hollow Rd, 5 mi nw of Andes, Town of Delhi

372 Brooks 26 Jun 51--NYS, Brooks; 3108 Brooks 13 Jul 54--NYS

Cleveland Farm, 1 1/2 mi s by w of W. Harpersfield, Town of Kortright

1671 Brooks 11 Jul 52--NYS

N of Lordville, Town of Hancock 16634 S. J. Smith & Crossman 18 Jun 54--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

3031 Brooks 6 Jul 54--Brooks

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

1 mi s of Cadosia, Town of Hancock

18998 S. J. Smith & Wilcox 10 Aug 55--NYS

Trout Pond Trail, 4 mi e by s of Corbett, Town of Colchester

KLB obs 30 May 74

Vic of Launt Pond, Town of Walton

KLB obs 11 May 75

Post Place, 2 1/2 mi s of Stamford, Town of Stamford

KLB & Elisabeth Post obs 19 Jun 78

Greene County

Windham, Town of Windham

2409 Barnhart at 3400 ft [n.d.]--BKL; 958 N. Taylor 28-31 Jul 09--NY

Haines Falls, Town of Hunter

Lighthipe [n.d.]--BKL

Hunter Mt, Town of Hunter

20964 W. C. Muenschler & Brown at 4000 ft [n.d.]--CU

Onteora Woods, Town of Hunter

Anna M. Vail 6 Jul 1891--NY

Tannersville, Town of Hunter

Anna M. Vail 6 Jul 1891--NY

East Jewett, Town of Jewett

Anna M. Vail 16 Jul 1891--NY

Kaaterskill Clove, Town of Hunter

M. Hollinshead 1 Sep 13--PENN

Vic of Haines Falls, Town of Hunter

R. H. Torrey obs above 3000 ft in Torreya 30: 24-25, 1930.

Sherrill Mt, Town of Lexington

Kudish (1971), p. 124

Hunter Mt, Town of Hunter

Kudish (1971), p. 124.

Sullivan County

L. Shandeelee, Town of Callicoon

P. Wilson 27 Aug 18--NY

Liberty, Town of Liberty

4632 E. Whitney 30 Jul 35--NYS

Fir Brook Swamp, ne of Willowemoc, Town of Neversink

SJS obs 5 Oct 50

(Continued on p. 175)

Lycopodium obscurum L.
Tree Clubmoss

Flora of
THE CATSKILLS
New York State



Delaware County

- W. Harpersfield, Town of Harpersfield
D. L. Topping 2 Oct 1895--US
Stamford, Town of Stamford
611 N. Taylor 3-10 Jul 09--NY (var. dendroideum)
Arkville, Town of Middletown
E. N. Harvey--NY; F. Mulford & P. Wilson 29-31 May 15--NY;
P. Wilson 5 Jul 15 & 15 Jul 15--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
2046 N. Hotchkiss 10 May 27--NYS
Walton, Town of Walton
H. M. Denslow 8 Jul 27--NY (var. dendroideum)
Gould School, Town of Hancock
3492 E. Whitney 12 Jun 33--NYS
Vic of Meridale, Town of Meredith
4462 E. Whitney 26 Jul 35--NYS

Lycopodium obscurum

S of Davenport, Town of Davenport
5026 E. Whitney 17 Jun 36--NYS
2 mi s of Grand Gorge, Town of Roxbury
Smith & Brooks obs 12 May 51
Bullet Hollow Rd, 5 mi nw of Andes, Town of Delhi
371 Brooks 26 Jun 51--NYS
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
655 Brooks 25 Jul 51--Brooks, NYS
Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford
KLB obs 3 Jul 54
Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina
KLB obs 14 Jul 54
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
4 mi se of Downsville, Town of Colchester
KLB obs 12 Jun 73
Basin Clove Rd, 1 1/2 mi s by e of Delancey, Town of Hamden
KLB obs 11 May 75
Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville
KLB obs 7 Sep 75

Greene County

Onteora Woods, Town of Hunter
Anna M. Vail [1891]--NY
Tannersville, Town of Hunter
Anne M. Vail 21 Jun 1891--NY; 278 N. Taylor 1 Jun 09--NY
Windham, Town of Windham
944 N. Taylor 28-31 Jul 09--NY
Vic of Haines Falls, Town of Hunter
R. H. Torrey obs above 3000 ft in Torreya 30: 24-25, 1930.
2 mi e of Maplecrest, Town of Windham
12591 S. J. Smith 11 Oct 52--NYS
Brunner Place, 4 mi n of Halcott Center, Town of Halcott
KLB obs 9 Jun 75

Sullivan County

Ne of Willowemoc, Town of Neversink
SJS obs 15 Aug 52

Ulster County

W. Shokan, Town of Olive
Peck Jul & Aug [n.d.]--NYS
Along Beaverkill, e of Turnwood, Town of Hardenburgh
9963 H. A. Gleason [n.d.]--NY
Pine Hill, Town of Shandaken
F. M. Hexamer 23 Aug 1884 & 8 Sep 1885--NY
Shandaken, Town of Shandaken
237 Miller Sep 1898--NYS

Lycopodium obscurum

Summit of Slide Mt, Town of Shandaken

21 N. Taylor at 4220 ft 5 Sep 18--BKL; 6713 M. S. Baxter 6 Aug 26--
Baxter

Ulster Heights, Town of Warwarsing

1039 H. Dunbar 18 Jun 57 (var. obscurum)--Domville

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

889 M. Domville 6 Sep 70 (var. dendroideum)--Domville

Vic of Frost Valley Camp, Town of Denning

KLB obs 11 Jun 74

Lycopodium lucidulum (continued from p. 172)

1 mi ne of Basket School, Town of Fremont

20338 S. J. Smith & Fenolt 22 Jun 56--NYS

Ulster County

Along Beaverkill, e of Turnwood, Town of Hardenburgh

9944 H. A. Gleason [n.d.]--NYS

Pine Hill, Town of Shandaken

F. M. Hexamer 21 Aug 1884--NY

Shandaken, Town of Shandaken

18 Miller Sep 1898--PENN; 233 Miller 10 Aug 02--NYS

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917.

Summit of Slide Mt, Town of Shandaken

13 N. Taylor at 4220 ft 5 Sep 18--BKL

Watson Hollow, Town of Denning

SJS obs 15 Aug 57

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Balsam Cap, Hemlock & Fir mts, Town of Shandaken

Kudish (1971), p. 125.

Big Indian & Schoolhouse mts, Town of Denning

Kudish (1971), p. 125

Doubletop, Balsam L, Balsam & Eagle mts, Town of Hardenburgh

Kudish (1971), pp. 125, 128.

Lycopodium sabinaefolium Willd.
Savin-leaved Clubmoss

Flora of
THE CATSKILLS
New York State

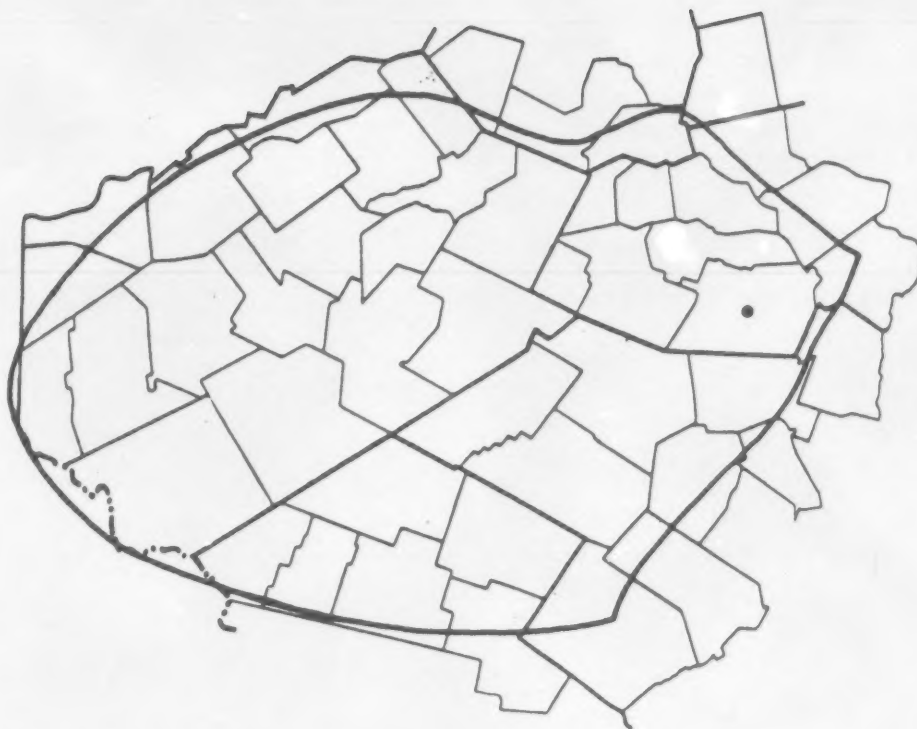


Delaware County

Vic of Delhi, Town of Delhi
2045 N. Hotchkiss 10 May 27--CU

Lycopodium selago L.
Fir Clubmoss

Flora of
THE CATSKILLS
New York State



Greene County

Haines Falls, Town of Hunter

George R. Proctor in Rhodora 49: 53, 1947. (Specimen deposited in Phil.)

Wildcat Creek, Haines Falls, Town of Hunter

33972 S. J. Smith et al. 28 Jul 62--NYS

Lycopodium tristachyum Pursh
Ground-cedar

Flora of
THE CATSKILLS
New York State



Delaware County

Stamford, Town of Stamford
622 N. Taylor 3-10 Jul 09--NY
Arkville, Town of Middletown
P. Wilson 5 Jul 15--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Bear Spring Mt, vic of Walton, Town of Walton
4526 E. Whitney 27 Jul 35--NYS
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
662 Brooks 25 Jul 51--Brooks, NYS; 661 Brooks 25 Jul 51--NYS;
864 Brooks 26 Aug 51--NYS
4 1/2 mi nw by n of Andes, Town of Delhi
KLB obs 31 May 52
Cleveland Farm, 1 1/2 mi s by w of W. Harpersfield, Town of Kortright
1672 Brooks 11 Jul 52--NYS
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59

Lycopodium tristachyum

Trout Pond Trail, 4 mi e by s of Corbett, Town of Colchester

KLB obs 30 May 74

Campane Place, 1 mi e of Vega, Town of Roxbury

KLB obs 31 Jul 76

2 mi e of Meridale, Town of Meredith

KLB obs 19 Sep 76

Greene County

2 mi e of Maplecrest, Town of Windham

12592 S. J. Smith 11 Oct 52--NYS

Ulster County

Bull Run, vic of Denning, Town of Denning

3604 C. J. Elting 12 May 03--NYS

Shandaken, Town of Shandaken

251 Miller 21 Aug 03--NYS

Selaginella rupestris (L.) Spring
Spike-moss

Flora of
THE CATSKILLS
New York State

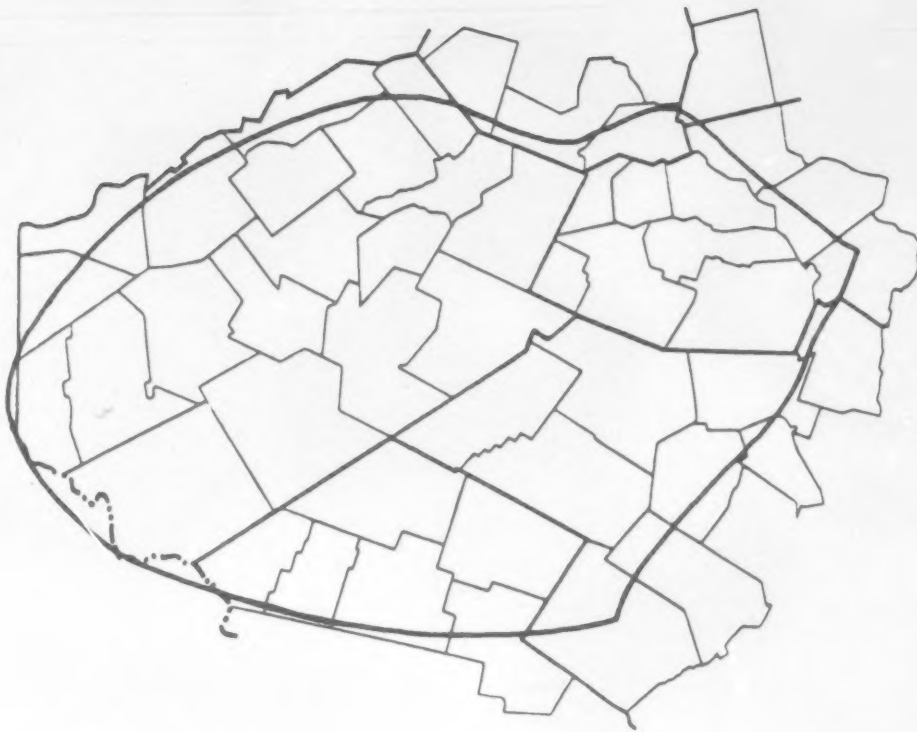


Greene County

Catskill Mt House, Otis Summit, Town of Hunter
Ralph H. Smith 20 Aug 47--NYS

Isoëtes macrospora Dur.
Lake Quillwort

Flora of
THE CATSKILLS
New York State



Lake in Catskills
E. Durand in 19th Rept. Bd. of Regents, 1866.

Botrychium dissectum Spreng.
Cut-leaved Grape Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

F. Mulford Jul 03--BKL; H. M. Denslow 18 Aug 20--NYS (var. obliquum)

Delhi, Town of Delhi

N. Hotchkiss obs 10 May 27 (var. obliquum)

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

Var. obliquum: 840 Brooks 26 Aug 51--NYS; 930 & 932 Brooks 22 Sep 51--

NYS; 934 Brooks 22 Sep 51--Brooks: 936 & 937 Brooks 22 Sep 51--NYS;

var. dissectum: 931 Brooks 22 Sep 51--NYS; 935 Brooks 22 Sep 51--NYS,
Brooks

1/2 mi s of Davenport, Town of Davenport

KLB obs 30 Sep 75

Greene County

Onteora, Town of Hunter

Anna M. Vail [1891] (var. obliquum)--NY

(Continued on p. 184)

Botrychium lanceolatum (Gmel.) Rupr.
ssp. *angustisegmentum* (Pease & Moore) Clausen
Lance-leaved Grape Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Vic of N. Franklin, Town of Franklin

G. Cleveland in Fern Bul. 16: 101-103, 1908.

Stamford, Town of Stamford

5800 P. Dowell 6 Jul 09--NY, NYS, BKL

Arkville, Town of Middletown

F. Mulford Jul 03 & 14 Jun 12--BKL; H. M. Denslow 8 Aug 20 & 18 Aug 20
--NYS

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

3086 Brooks 10 Jul 54--Brooks, NYS; 2330 Brooks 29 May 53--Brooks
(duplicate to Dr. Mansfield)

Greene County

Windham, Town of Windham

N. Taylor 2 Aug 09--NY; 4594 H. K. Svenson [25 Aug 31]--BKL

Botrychium lanceolatum ssp. *angustisegmentum*

N slope of Hunter Mt, Town of Hunter
4594 H. K. Svenson 24 Aug 31--BKL

Ulster County

Pine Hill, Town of Shandaken
Peck [n.d.]--NYS
Shandaken, Town of Shandaken
M. F. Miller 21 Jul 1899--PENN
Belle Ayre Range, Town of Shandaken
F. C. Buckheister Jul 04--O
Wittenberg Mt, Town of Shandaken
J. M. MacFarlane 27 Jul 07--PENN
Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917.
Panther Mt, Town of Shandaken
H. M. Denslow 8 Jul 19--NY
Oliverea, Town of Shandaken
Daley 1 Aug 26--NYS
Slide Mt, Town of Shandaken
451 O. A. Phelps 23 Jul 60--NYS

Botrychium dissectum (continued from p. 182)

4 mi e of Maplecrest, Town of Windham
SJS obs 11 Oct 52 (var. obliquum)

Ulster County

Bushnellsville, Town of Shandaken
Mary F. Miller 22 Aug 1898 (var. obliquum)--PENN; M. F. Miller 6 Sep
1898 (var. dissectum)--PENN; 16 M. F. Miller 2 Sep 03 (var. obliquum)
--NYS
Shandaken, Town of Shandaken
29 Miller 24 Aug 09 (var. dissectum)--NYS
Panther Mt, Town of Shandaken
H. M. Denslow 7 Jul 19 (var. obliquum)--NY

Botrychium matricariifolium A. Br.
Matricary Grape Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Griffins Corners [Fleischmanns], Town of Middletown
J. C. Buchheister in Fern Bul. 11: 15-16, 1903.
Arkville, Town of Middletown
F. Mulford Jul 03--BKL; H. M. Denslow 8, 27, 29 Jul 20--NYS
Bald Mt, vic of Stamford, Town of Stamford
5786 P. Dowell 5 Jul 09--NY, NYS
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Stamford, Town of Stamford
3445 E. Whitney 9 Jun 33--NYS
Vic of Hawley, Town of Hamden
4502 E. Whitney 26 Jul 35--NYS
S of Davenport, Town of Davenport
5036 E. Whitney 17 Jun 36--NYS
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
2363 Brooks 30 May 53--Presented to Dr. Mansfield; 3032 Brooks
6 Jul 54--NYS; 3085 Brooks 10 Jul 54--Brooks, NYS; 3087 Brooks
10 Jul 54--NYS

Botrychium matricariaefolium

1 mi e of Kortright Center, Town of Kortright
4369 Brooks 9 Jul 59--NYS

Greene County

Tannersville, Town of Hunter
C. S. Williamson at 2500 ft [n.d.]--0
Haines Falls, Town of Hunter
E. R. Lippincott Jul 31--NYS
Hunter Mt, Town of Hunter
4593 H. K. Svenson 24 Aug 31--BKL
Windham High Peak, Town of Windham
H. K. Svenson obs 25 Aug 31 in Torreya 31: 154-157, 1931.

Sullivan County

Ne of Long Eddy, Town of Fremont
SJS obs 20-22 Jun 56

Ulster County

Shandaken, Town of Shandaken
3 & 4 Mary F. Miller 30 Jul 01--NYS
Belle Ayre Range, Town of Shandaken
F. C. Buckheister Jun 04--0
Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
A. H. Graves quoting O. P. Medsger in Torreya 27: 13-14, 1927 (as B. neglectum).
Willow, Town of Woodstock
H. Dunbar obs Jun 60
Brook Trail, Slide Mt, Town of Shandaken
452 O. A. Phelps 23 Jul 60--NYS

Botrychium multifidum (Gmel.) Rupr.
ssp. *multifidum*
Leathery Grape Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Meridale, Town of Meredith
4459 E. Whitney 26 Jul 35--NYS

Greene County

Big Hollow [Maplecrest], Town of Windham
Barnhart at 2000 ft [n.d.]--NY

Botrychium multifidum (Gmel.) Rupr.
ssp. silaifolium (Presl) Clausen

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

H. M. Denslow 29 Jul 20--NYS

Meridale, Town of Meredith

4459 E. Whitney 26 Jul 35--NYS

Ulster County

Shandaken, Town of Shandaken

25 Mary F. Miller 21 Aug 03--NYS

Botrychium x oneidense (Gilib.) House
(B. multifidum x B. dissectum)
Oneida Grape Fern

Flora of
THE CATSKILLS
New York State



Arkville, Town of Middletown
E. M. Harvey--NY
Rosa Farm, 1 mi s of Margaretville, Town of Middletown
BW8-18 Brooks 19 Sep 71

Greene County

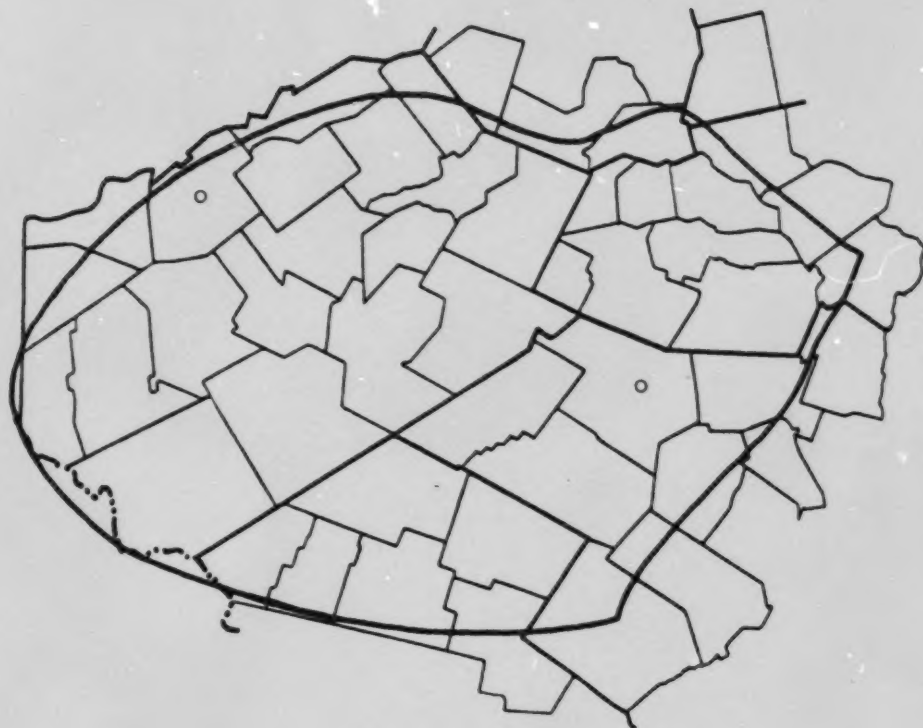
Big Hollow [Maplecrest], Town of Windham
2406 Barnhart [n.d.]--NY
N slope of Hunter Mt, Town of Hunter
4599 H. K. Svenson 24 Aug 31--BKL
Windham High Peak, Town of Windham
H. K. Svenson obs 25 Aug 31 in Torreys 31: 154-157, 1931.

Ulster County

Town of Shandaken
H. M. Denslow 28 Aug 19--NY

Botrychium simplex E. Hitchc.
Dwarf Grape Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Vic of N. Franklin, Town of Franklin
G. Cleveland in Fern Bul. 16: 101-103, 1908.
Upland pasture, Catskill Mts
J. C. Buchheister Jun 09--0

Ulster County

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
A. H. Graves quoting O. P. Medsger in Torreya 27: 14, 1927.

Botrychium virginianum (L.) Sw.
Rattlesnake Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Arkville, Town of Middletown

E. N. Harvey--NY; F. Mulford Jul 03--BKL

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Stamford, Town of Stamford

3444 E. Whitney 9 Jun 33--NYS

Gould School, Town of Hancock

3501 E. Whitney 12 Jun 33--NYS

Bear Spring Mt, vic of Walton, Town of Walton

4511 E. Whitney 27 Jul 55--NYS

Vic of Youngs, e of Sidney, Town of Sidney

5064 E. Whitney 19 Jun 36--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

186 Brooks 27 May 51--NYS; 698 Brooks 26 Jul 51--NYS; 2325 Brooks

29 May 53--Brooks

Botrychium virginianum

2 mi s of Grand Gorge, Town of Roxbury.

Smith & Brooks obs 12 May 51

Cameron Farm, 6 mi nw of Andes, Town of Delhi

323 Brooks 25 Jun 51--Brooks

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Greene County

Hunter Mt, Town of Hunter

H. K. Svenson obs 24 Aug 31 in *Torreya* 31: 154-157, 1931.

Windham High Peak, Town of Windham

H. K. Svenson obs 25 Aug 31 in *Torreya* 31: 154-157, 1931.

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in *Am. Fern Jour.* 4: 1-5, 1914.

Sullivan County

S side of Rondout Reservoir, Town of Neversink

SJS obs 20-22 Jun 56

Vic of Obernburg, Town of Fremont

SJS obs 7 Sep 56

Ulster County

Shandaken, Town of Shandaken

32 Mary F. Miller 18 Jun 03--NYS

Highmount, Town of Shandaken

3437 E. Whitney 10 Jun 33--NYS

Overlook Mt, Town of Woodstock

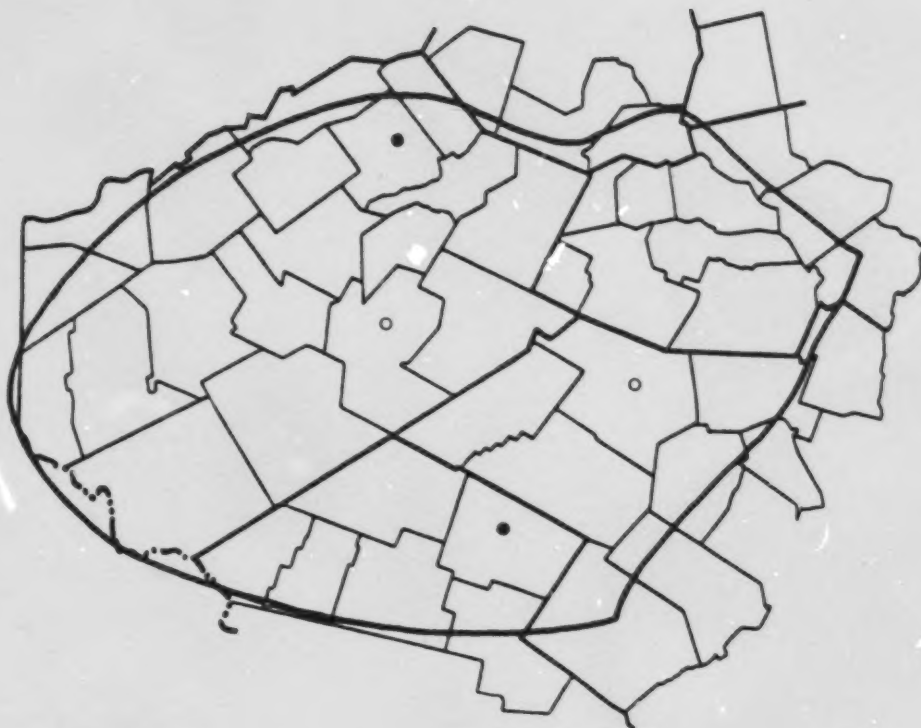
KLB & Mary Domville obs 12 Jul 70

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

Ophioglossum vulgatum L.
Adder's-tongue

Flora of
THE CATSKILLS
New York State



Delaware County

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

McMurdy Hill brook, 1 1/2 mi n of S. Kortright, Town of Kortright

1763 Brooks & Smith 19 Jul 52--Brooks, NYS

Sullivan County

S of Long Pond, vic of Neversink, Town of Neversink

3 G. L. Stebbins Jr. 23 Jun 34--NYS

Ulster County

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

A. H. Graves quoting O. P. Medsger in Torreya 27: 14, 1927.

Osmunda cinnamomes L.
Cinnamon Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin
M. Platt, 1840
Arkville, Town of Middletown
E. N. Harvey 1905--NY
Stamford, Town of Stamford
N. Taylor 3-10 Jul 09--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
S of Davenport, Town of Davenport
5031 E. Whitney 17 Jun 36--NYS
2 mi s of Grand Corge, Town of Roxbury
Smith & Brooks obs 12 May 51
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
303 Brooks 24 Jun 51--NYS; 667 Brooks 25 Jul 51--NYS; 3034 Brooks
6 Jul 54--Brooks
5 mi e of Delancey, Town of Delhi
KLB obs 30 May 52

Osmunda cinnamomea

- 1 1/2 mi n of Lordville, Town of Hancock
SJS obs 18 Jun 54
Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield
KLB obs 2 Jul 55
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
4 mi se of Downsville, Town of Colchester
KLB obs 12 Jun 73
Vic of Launt Pond, Town of Walton
KLB obs 28 Jul 74
Coulter Brook, 2 mi s of Bovina, Town of Bovina
KLB obs 2 Jun 75
Vic of Sidney Center, Town of Sidney
KLB obs 7 Sep 75
2 mi sw of Meridale, Town of Meredith
KLB obs 21 May 76
2 mi nw of Hamden, Town of Hamden
KLB obs 30 May 76

Greene County

- Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.
Onteora, Town of Hunter
Anna M. Veil 20 Jul 1891--NY; J. K. Small in Torr. Club Bul. 20: 466,
1893.
Windham, Town of Windham
971 N. Taylor at 1700 ft 28-31 Jul 09--NY
Deep Notch, vic of West Kill, Town of Lexington
S. H. Burnham quoting N. Y. State Mus. Rept. 26: 89, 1874 in Am. Fern
Jour. 4: 1-5, 1914.
2 mi n of Halcott Center, Town of Halcott
KLB obs 25 Jun 73
Vic of Jewett, Town of Jewett
KLB obs 14 Sep 75

Sullivan County

- Fir Brook Swamp, ne of Willowemoc, Town of Neversink
SJS obs 5 Oct 50
E side of Long Eddy, Town of Fremont
SJS obs 7 Sep 56
1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74
4 mi n of Callicoon Center, Town of Callicoon
KLB obs 21 Jun 75
Vic of Loch Sheldrake, Town of Fallsburg
KLB obs 2 Aug 76

(Continued on p. 205)

Osmunda claytoniana L.
Interrupted Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin
M. Platt, 1840

Arkville, Town of Middletown

E. N. Harvey 05--NY; 519 N. Taylor 3-4 Jun 09--NY; P. Wilson
3 Jul 15--NY

Stamford, Town of Stamford

809 N. Taylor 3-10 Jul 09--NY

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Delhi, Town of Delhi

N. Hotchkiss obs 10 May 27

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

656 Brooks 25 Jul 51--NYS; 2743 Brooks 30 May 54--Brooks

1 1/2 mi n of Lordville, Town of Hancock

SJS obs 18 Jun 54

E of Shinhopple, Town of Colchester

SJS obs 10 Aug 55

Osmunda claytoniana

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Merrill Farm, 2 mi s of Treadwell, Town of Franklin

KLB obs 10 Jul 59

3 mi s of Grand Gorge, Town of Roxbury

KLB obs 19 Jun 73

Vic of Meridale, Town of Meredith

KLB obs 7 Jul 73

Vic of Launt Pond, Town of Walton

KLB obs 28 Jul 74

Bush Clôve, 4 mi se of Delancey, Town of Hamden

KLB obs 16 Aug 74

Vic of Chamberlain Brook, Town of Tompkins

KLB obs 31 Aug 75

Vic of Silver L, Town of Deposit

KLB obs 31 Aug 75

Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

Rathbone Hill Rd, 2 mi sw of Davenport Center, Town of Davenport

KLB, Kathy Emerson, & Phil Caswell obs 23 Aug 78

Greene County

Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874: E. R. Lippincott

Jul 31--NYS

Ontario, Town of Hunter

Anna M. Vail 21 Jul 1891--NY; J. K. Small in Torr. Club Bul. 20: 466, 1893

1/2 mi n of Bushnellsville, Town of Lexington

SJS obs 15 Jun 56

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

Vic of Beaches Corners, Town of Jewett

KLB obs 4 Jul 75

2 mi n by e of Ashland, Town of Ashland

KLB obs 4 Jul 75

2 mi n of Windham, Town of Windham

KLB obs 21 Jul 75

Sullivan County

Krom Hollow, n of Liberty, Town of Liberty

4540 E. Whitney 29 Jul 35--NYS

Ne of Willowemoc, Town of Neversink

SJS obs 15 Aug 52

1 mi sw of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

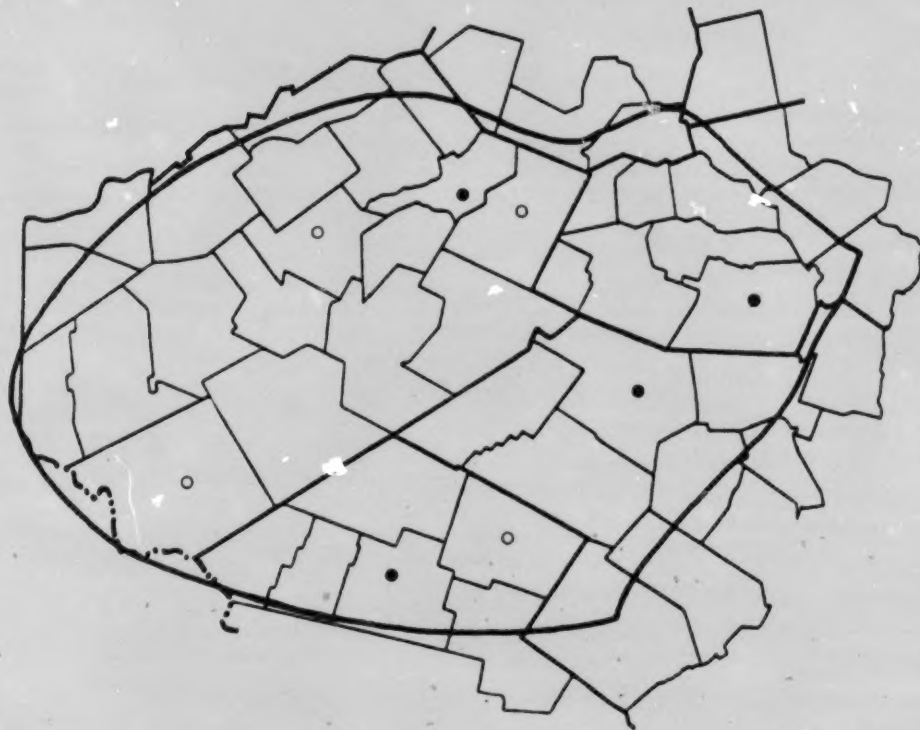
4 mi n of Callicoon Center, Town of Callicoon

KLB obs 21 Jun 75

(Continued on p. 199)

Osmunda regalis L.
var. *spectabilis* (Willd.) Gray
Royal Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Stamford, Town of Stamford
807 N. Taylor 09--NY, NYS
2 mi s of Grand Gorge, Town of Roxbury
Smith & Brooks obs 12 May 51
4 1/2 mi nw by n of Andes, Town of Delhi
KLB obs 31 May 52
E of Kilgour Spur, Town of Hancock
SJS obs 18 Jun 54

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.
Onteora, Town of Hunter
Anna M. Vail at 2000 ft 21 Jul 1891--NY

Osmunda regalis var. *spectabilis*

Sullivan County

Fox Mt, vic of Liberty, Town of Liberty

932 E. Whitney 31 May 30--NYS

Fir Brook Swamp, ne of Willowemoc, Town of Neversink

SJS obs 5 Oct 50

Ulster County

Phoenicia valley, Town of Shandaken

J. M. MacFarlane Jul-Aug 07--FENN

Osmunda claytoniana (continued from p. 197)

Vic of Tennanah L, Town of Fremont

KLB obs 19 Jul 76

Vic of Loch Sheldrake, Town of Fallsburg

KLB obs 2 Aug 76

Ulster County

Phoenicia, Town of Shandaken

J. M. MacFarlane Jul-Aug 07--FENN

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

5 1/2 mi se of Margaretville, Town of Hardenburgh

KLB obs 4 Sep 72

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Vic of Frost Valley Camp, Town of Denning

KLB obs 11 Jun 74

3 mi nw of Tabasco, Town of Rochester

KLB & Paul Huth obs 19 Aug 76

Lygodium palmatum (Bernh.) Sw.
Climbing Fern

Flora of
THE CATSKILLS
New York State



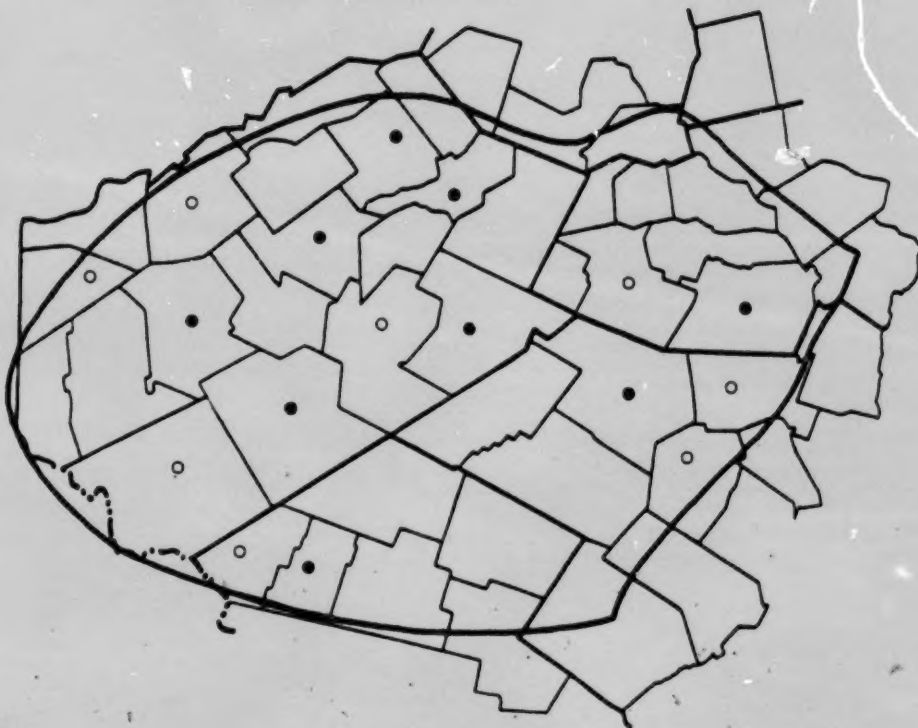
Greene County

7 Town of Hunter

Torr. Club Bul. 5: 5 and 5: 39, 1874; N. Y. State Mus. Rept. 28: 84, 1876; B. D. Gilbert quoting Peck in Fern Bul. 11: 97-105, 1903.

Adiantum pedatum L.
Maidenhair Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Arkville, Town of Middletown

E. N. Harvey [1905]--NY; P. Wilson 4 Jul 15 & 23 Jul 15--NY

Stamford at 1800 ft, Town of Stamford

P. Dowell 3-10 Jul 09--NY

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Downsville, Town of Colchester

3513 E. Whitney 27 Jun 35--NYS

Bear Spring Mt, vic of Walton, Town of Walton

4521 E. Whitney 27 Jul 35--NYS

W. Kortright, Town of Kortright

5044 E. Whitney 17 Jun 36--NYS

Cameron Farm, 6 mi nw of Andes, Town of Delhi

393 Brooks 27 Jun 51--NYS

Adiantum pedatum

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

628 Brooks 24 Jul 51--Brooks, NYS

E side of Point Mt, vic of Cadosia, Town of Hancock

SJS obs 17 Jun 54

Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

Greene County

Onteora, Town of Hunter

Anna M. Vail 18 Jul 1891 at 2100 ft--NY: J. K. Small in Torr. Club

Bul. 20: 459, 1893.

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

2 mi s by w of West Kill, Town of Lexington

KLB obs 27 May 75

Sullivan County

Vic of L Shandalee, Town of Callicoon

P. Wilson 27 Aug 18--NY

Ne of Long Eddy, Town of Fremont

SJS obs 20-22 Jun 56

Ulster County

Phoenicia, Town of Shandaken

J. M. MacFarlane 1 Aug 07--PENN

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Asplenium platyneuron (L.) Oakes
Ebony Spleenwort

Flora of
THE CATSKILLS
New York State



Delaware County

Vic of Franklin, Town of Franklin

G. Cleveland in Fern Bul. 16: 101-103, 1908.

Arkville, Town of Middletown

H. M. Denslow 20 Aug 20--NYS

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Margaretville, Town of Middletown

3515 E. Whitney 12 Jun 33--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

310 Brooks 24 Jun 51--Brooks

Kilgour Spur, Town of Hancock

SJS obs 18 Jun 54

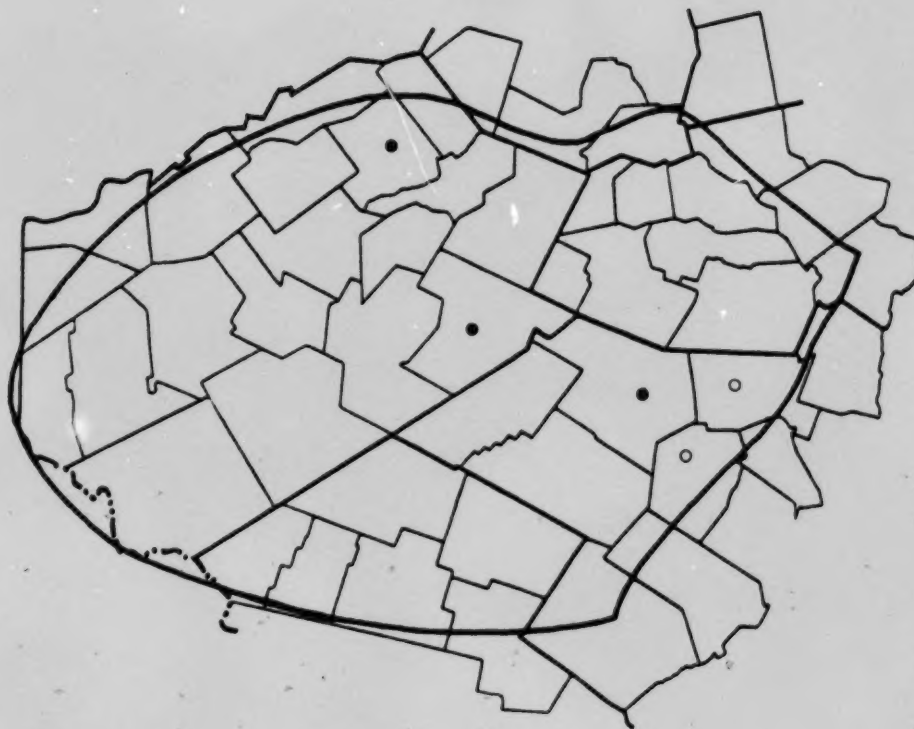
Wake Robin, vic of Roxbury, Town of Roxbury

Phil Caswell obs, personal communication 10 Dec 78

(Continued on p. 205)

Asplenium rhizophyllum L.
Walking Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

F. Mulford Jun 15--BKL; H. M. Denslow 10 Jul 20--NYS

Margaretville, Town of Middletown

9387 Smith et al. 12 May 51--NYS, Brooks

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

4375 Brooks 11 Jul 59--Brooks, NYS

Ulster County

Catskill Mts

Peck Jul--NYS

Pantherkill, vic of Phoenicia, Town of Shandaken

J. F. MacFarlane [n.d.]--NYS

Shandaken, Town of Shandaken

126 Mary F. Miller 7 Oct 02--NYS

Asplenium rhizophyllum

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

A. H. Graves quoting O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917.

Lewis Hollow, Town of Woodstock

M. Domville obs [12 Jul 70]

Peekamoose Rd, Town of Olive

M. Domville obs 1973

Asplenium platyneuron (continued from p. 203)

Greene County

Windham High Peak, Town of Windham

H. K. Svenson obs 25 Aug 31 in Torreyia 31: 154-157, 1931.

Stony Clove, vic of Hunter, Town of Hunter

40254 S. J. Smith & Hammond 15 Jun 66--NYS

Prattsville, Town of Prattsville

KLB obs 19 Jun 73

Ulster County

Bushnellsville, Town of Shandaken

Mary F. Miller 28 Aug 1898--PENN

Shandaken, Town of Shandaken

82 Mary F. Miller 30 Aug 01--NYS

W. Shokan, Town of Olive

Freda Krom 22 Sep 27--NYS

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Osmunda cinnamomea (continued from p. 195)

Ulster County

Shandaken, Town of Shandaken

Peck [n.d.]--NYS

Highmount swamp, Town of Shandaken

J. C. Buckheister in Fern Bul. 11: 15-16, 1903.

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

KLB & Mary Domville obs 26 Aug 72

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Vic of Frost Valley Camp, Town of Denning

KLB obs 11 Jun 74

Rider Hollow, 2 mi e of Dry Brook, Town of Hardenburgh

KLB obs 7 Jun 75

Asplenium trichomanes L.
Maidenhair Spleenwort

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

E. N. Harvey--NY; F. Mulford Jun 15--BKL

Wilson Hollow, Town of Colchester

4531 E. Whitney 27 Jul 35--NYS

2 mi s of Grand Gorge, Town of Roxbury

9235 Smith et al. 12 May 51--NYS

Margaretville, Town of Middletown

Smith & Brooks obs 12 May 51; 4446 Brooks 9 May 59--Brooks

W side of Point Mt, vic of Cadosia, Town of Hancock

16531 Smith 17 Jun 53--NYS

Greene County

Edgewood, Town of Hunter

J. M. MacFarlane at 1900 ft [n.d.]--NY

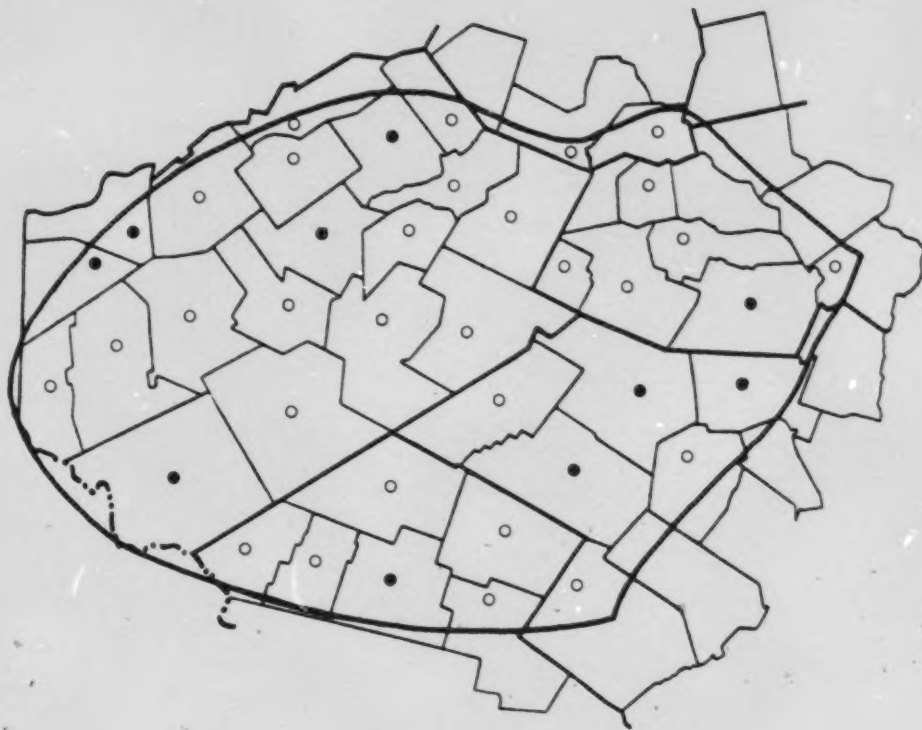
Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

(Continued on p. 211)

Athyrium filix-femina (L.) Roth
ssp. *angustum* (Willd.) Clausen
Lady Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Mt Utasyantha, 1 1/2 mi e by s of Stamford, Town of Stamford
P. Dowell in Am. Fern Jour. 1: 12-14, 1910.
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Gould School, Town of Hancock
3503 E. Whitney 12 Jun 33--NYS
Robinson L, w of Delhi, Town of Delhi
4497 E. Whitney 26 Jul 35--NYS
Vic of Youngs, Town of Sidney
5065 E Whitney 19 Jun 36--NYS
Vic of E. Masonville, Town of Masonville
5099 E. Whitney 19 Jun 36--NYS
2 mi s of Grand Gorge, Town of Roxbury
Smith & Brooks obs 12 May 51
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
453 Brooks 8 Jul 51--Brooks; 536 Brooks 21 Jul 51--NYS

Athyrium filix-femina ssp. angustum

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina
KLB obs 14 Jul 54
Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield
KLB obs 2 Jul 55
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
Dick Mason Rd, 2 mi nw of Delhi, Town of Delhi
4975 Brooks 4 Jul 70--NYS
Rosa Farm, 1 mi s of Margaretville, Town of Middletown
BW2-32 Brooks 4 Jul 66
Gregorytown, Town of Colchester
KLB obs 3 Jul 71
Spring Valley Rd, 3 mi se of Meridale, Town of Meredith
KLB obs 7 Aug 71
Delancey, Town of Hamden
KLB obs 7 Aug 71
Vic of Launt Pond, Town of Walton
KLB obs 28 Jul 74
Vic of Chamberlain Brook, Town of Tompkins
KLB obs 31 Aug 75
Vic of Silver L, Town of Deposit
KLB obs 31 Aug 75
Vic of Sidney Center, Town of Sidney
KLB obs 7 Sep 75

Greene County

Catskill Mts
Peck [n.d.]--NYS
Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.
Onteora, Town of Hunter
Anna M. Vail at 2000 ft [1891]--NY; J. K. Small in Torr. Club Bul. 20:
460, 1893.
Stony Clove, vic of Hunter, Town of Hunter
S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.
Mts above Palenville, Town of Catskill
H. House obs 10 Aug 28
2 mi n of Halcott Center, Town of Halcott
KLB obs 25 Jun 73
4 mi e of West Kill, Town of Lexington
KLB obs 13 Sep 73
2 mi s of Jewett, Town of Jewett
KLB obs 1 Jul 75
Vic of E. Ashland, Town of Ashland
KLB obs 4 Jul 75

Schoharie County

Vic of W. Conesville, Town of Conesville
KLB obs 1 Jul 75

Athyrium filix-femina ssp. *angustum*

Vic of S. Gilboa, Town of Gilboa
KLB obs 22 Sep 75

Sullivan County

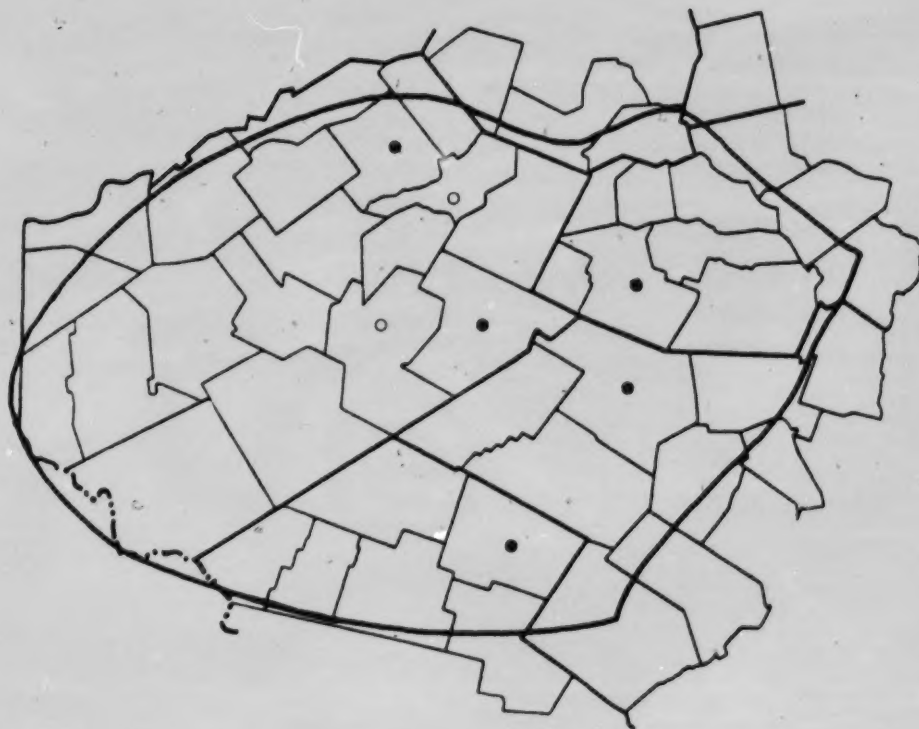
Krom Hollow, n of Liberty, Town of Liberty
4548 E. Whitney 29 Jul 35--NYS
Fir Brook Swamp, ne of Willowemoc, Town of Neversink
SJS obs 5 Oct 50
Ne of Long Eddy, Town of Fremont
SJS obs 20-22 Jun 56
1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74
2 mi n of N. Branch, Town of Callicoon
KLB obs 21 Jun 75
3 mi n of Woodbourne, Town of Fallsburg
KLB obs 2 Aug 76

Ulster County

Shandaken, Town of Shandaken
Mary F. Miller 23 Jun 1899, 19 Sep 1899, 3 Aug 02--NYS; 117 M. F.
Miller 27 Jul 03--NYS
Bushnellsville, Town of Shandaken
110 M. F. Miller 15 Jun 1900--NYS; 107 M. F. Miller 12 Aug 03--NYS
Big Indian, Town of Shandaken
96, 97, 99, 102, 109, 113, 122 M. F. Miller 27 Jul 03--NYS
Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
E. J. Alexander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.
Watson Hollow, Town of Denning
26112 S. J. Smith et al. 5 Sep 58--NYS
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Silver Hollow Rd, vic of Willow, Town of Woodstock
1065 M. Domville 1 Jul 71--Domville
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 18 Jul 73
1 mi ne of Dry Brook, Town of Hardenburgh
KLB obs 1 Jun 75

Athyrium pycnocarpon (Spreng.) Tidestr.
Narrow-leaved Spleenwort

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

P. Wilson 9 Jul 15--BKL

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

442 Brooks 8 Jul 51--Brooks, NYS; 627 Brooks 24 Jul 51--Brooks, NYS

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Greene County

West Kill Clove, Town of Lexington

E. R. Lippincott Jul 33--NYS

Sullivan County

Vic of Willowemoc, Town of Neversink

P. Van Gieson Aug 73--NYS

Athyrium pycnocarpon

Ulster County

Phoenicia, Town of Shandaken

C. N. Arnold [n.d.]--NYS

Asplenium trichomanes (continued from p. 206)

Deep Notch, vic of West Kill, Town of Lexington

S. H. Burnham quoting N. Y. State Mus. Rept. 26: 89, 1874 in Am. Fern
Jour. 4: 1-5, 1914; SJS obs 15 Jun 56

W of Palenville, Town of Catskill

9500 S. J. Smith 19 May 51--NYS

Ulster County

Shandaken, Town of Shandaken

Mary F. Miller 18 Sep 1898--PENN

Headwaters of Rondout Creek, Town of Denning

28846 S. J. Smith 12 Sep 59--NYS

Athyrium thelypteroides (Michx.) Desv.
Silvery Spleenwort

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Arkville, Town of Middletown

E. N. Harvey Jul 05--NY, PENN; F. Mulford Jul 03--BKL

Mt Utsayantha at 3200 ft, 1 1/2 mi e by s of Stamford, Town of Stamford

700 N. Taylor 3-10 Jul 09--NY

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Hubbels Cove, Town of Roxbury

955 E. Whitney 2 Jun 30--NYS

Roxbury, Town of Roxbury

3453 E. Whitney 9 Jun 33--NYS

Robinson L, w of Delhi, Town of Delhi

4499 E. Whitney 26 Jul 35--NYS

Bear Spring Mt, vic of Walton, Town of Walton

4518 E. Whitney 27 Jul 35--NYS

Masonville, Town of Masonville

5116 E. Whitney 19 Jun 36--NYS

Athyrium thelypteroides

Vic of Youngs, Town of Sidney

5074 E. Whitney 19 Jun 36--NYS

Cameron Farm, 6 mi nw of Andes, Town of Delhi

389 Brooks 27 Jun 51--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

441 Brooks 8 Jul 51--Brooks, NYS

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

4 mi se of Downsville, Town of Colchester

KLB obs 12 Jun 73

Greene County

Catskill Mts

Peck [n.d.]--NYS; A. Brown at 2400 ft [n.d.]--NYS

Stony Clove, vic of Hunter, Town of Hunter

Peck 1870 (Notes 2: 236); S. H. Burnham in Am. Fern Jour. 4: 1-5,
1914; SJS obs 21 Jul 62

East Kill, Valley L, Town of Jewett

Anna M. Vail [1891]--NY

Onteore, Town of Hunter

Anna M. Vail at 2000 ft [1891]--NY; J. K. Small in Torr. Club Bul.
20: 459, 1893.

Haines Falls, Town of Hunter

E. R. Lippincott Jul 31--NYS

Deep Notch, West Kill, Town of Lexington

SJS obs 15 Jun 56

Sullivan County

ne of Long Eddy, Town of Fremont

SJS obs 20-22 Jun 56

Ulster County

Shandaken, Town of Shandaken

Mary F. Miller 24 Sep 1899--PENN

Phoenicia, Town of Shandaken

J. M. MacFarlane 15 Aug 07--NYS

Highmount, Town of Shandaken

3463 E. Whitney 10 Jun 33--NYS

Watson Hollow, Town of Denning

SJS obs 15 Aug 57

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

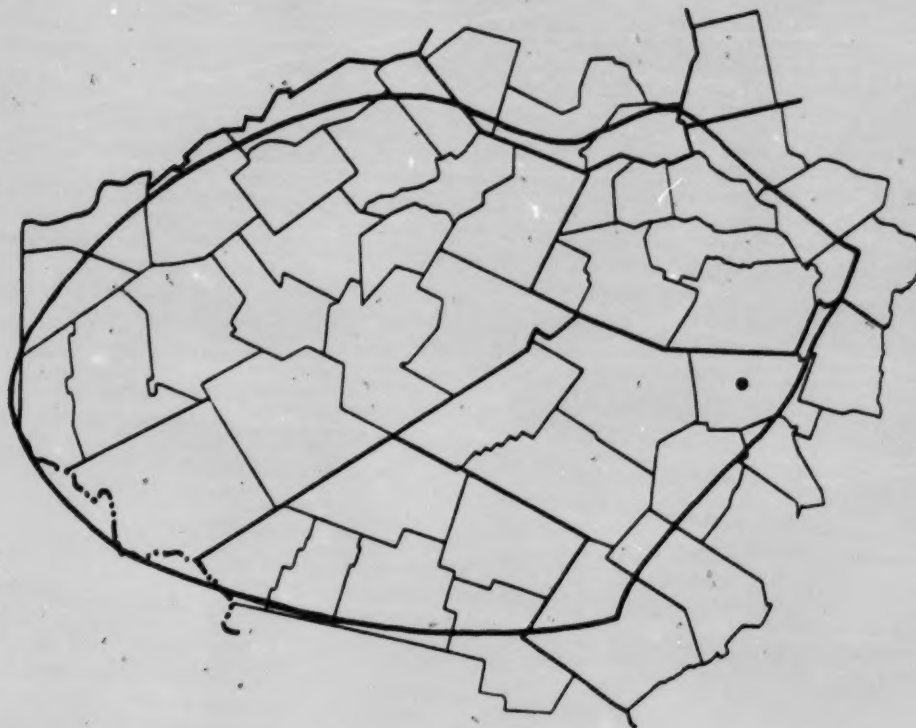
2048 M. Domville 8 Sep 73--Domville

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

Cheilanthes lanosa (Michx.) D. C. Eat.
Woolly Lip-fern

Flora of
THE CATSKILLS
New York State



Ulster County

Lewis Hollow, Town of Woodstock
706 M. Domville 12 Jul, 70--Domville

Cryptogramma stelleri (S. G. Gmel.) Prantl
Slender Cliff Brake

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

F. A. Mulford Jul 03, 12 Jun 12 & 4 Jun 15--BKL; E. N. Harvey [05]--NY;
P. Wilson 15 Jul 15--BKL; H. M. Denslow 10 Jul 20--NYS

Greene County

West Kill Notch, Town of Lexington

Mrs. I. M. Haring at 1901 ft [n.d.]--NY

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Haines Falls, Town of Hunter

H. Wheeler [n.d.]--O; Mrs. Mary L. Stevens Jun 1894--Gray; Peck in
Fern Bul. 12: 102, 1903; G. R. Proctor in Rhodora 49: 53-54, 1947
(specimen deposited in Phil); 34981 S. J. Smith et al. 24 Jul 65--NYS

(Continued on p. 229)

Cystopteris bulbifera (L.) Bernh.
Bulblet Bladder-fern

Flora of
THE CATSKILLS
New York State



Delaware County

Vic of N. Franklin, Town of Franklin

G. Cleveland in Fern Bul. 16: 101-103, 1908.

Watsuga Falls, 2 mi n by e of Delhi, Town of Delhi

3093 Brooks 11 Jul 54--Brooks, NYS

Margaretville, Town of Middletown

3622 Brooks 30 May 55--Brooks

Greene County

Stony Clove, vic of Hunter, Town of Hunter

Peck 1870 (notes 2: 236); S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Deep Notch, vic of West Kill, Town of Lexington

11542 E. P. Bicknell 14 Jun 1880--NYS

Between Hunter & Phoenicia, Town of Hunter

5183 H. K. Svenson 23 Jul 32--BKL

(Continued on p. 229)

Cystopteris fragilis (L.) Bernh.
var. *Mackayii* Lawson
Upland Fragile Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown
F. Mulford Jul 03--BKL
Stamford, Town of Stamford
P. Dowell in Am. Fern Jour. 1: 12-14, 1910.
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Hubbels Cove, Town of Roxbury
958 E. Whitney 30 May 29--NYS
Grand Gorge, Town of Roxbury
3447 E. Whitney 9 Jun 33--NYS
Downsville, Town of Colchester
3514 E. Whitney 12 Jun 33--NYS
Riverdale, Town of Delhi
4452 E. Whitney 25 Jul 35--NYS
Vic of Youngs, Town of Sidney
5075 E. Whitney 19 Jun 36 -NYS

Cystopteris fragilis var. *mackayii*

Cameron Farm, 6 mi nw of Andes, Town of Delhi

328 Brooks 25 Jun 51--Brooks

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

520 Brooks 21 Jul 51--NYS; 2741 Brooks 30 May 54--Brooks

Point Mt, vic of Cadosia, Town of Hancock

SJS obs 18 Jun 54

Watauga Falls, 2 mi n by e of Delhi, Town of Delhi

3094 Brooks 11 Jul 54--NYS

Delhi, Town of Delhi

4558 Brooks 5 Sep 59--NYS

3/4 mi s by w of Davenport Center, Town of Davenport

KLB obs 5 Sep 78

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Haines Falls, Town of Hunter

L. H. Lighthipe 26 Aug 1892 at 2000 ft--BKL; E. K. Lippincott Jul 31--NYS

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914; SJS obs 21 Jun 62

Deep Notch, vic of West Kill, Town of Lexington

SJS obs 15 Jun 56

Prattsville, Town of Prattsville

KLB obs 4 Jul 75

Sullivan County

Beaverkill Campsite, Town of Rockland

6736 S. J. Smith 15 Jun 50--NYS

2 1/2 mi s of Claryville, Town of Neversink

KLB obs 10 Jun 75

Ulster County

Vic of Shandaken, Town of Shandaken

213 Mary F. Miller 5 Jul 03--NYS

Vic of Phoenicia, Town of Shandaken

J. M. MacFarlane Jul-Aug 07--PENN

Vic of Oliveria, Town of Shandaken

N. Taylor 6-9 Sep 18 at 2000-2500 ft--BKL

Vic of Slide Mt, Town of Shandaken

S. H. Graves quoting O. P. Medsger in Torreya 27: 14, 1927.

Headwaters of Rondout Creek, Town of Denning

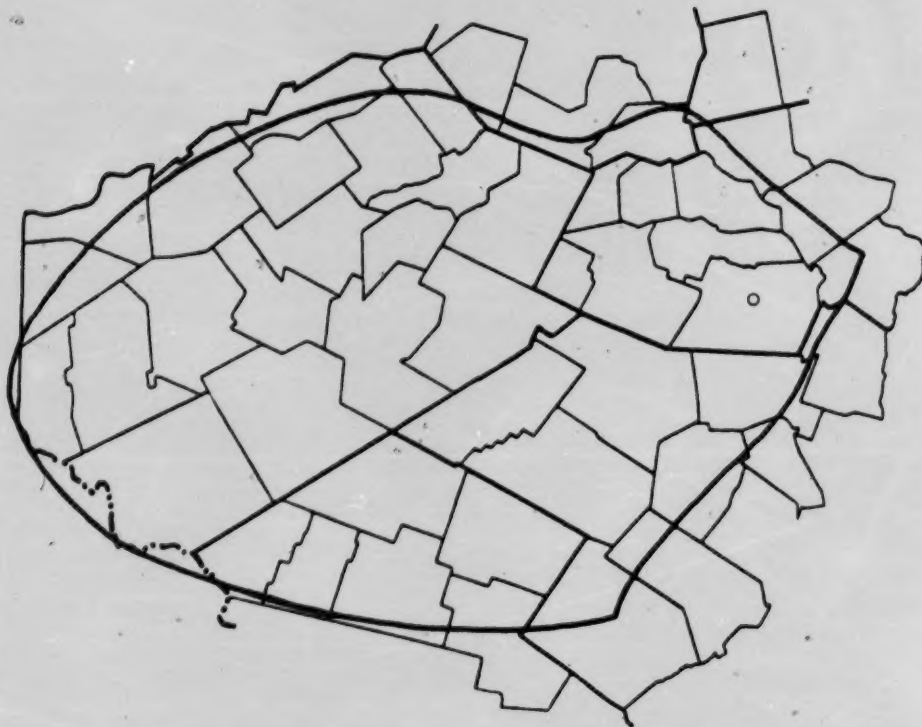
SJS obs 5 Sep 58

Lewis Hollow, Town of Woodstock

M. Domville obs 3 Jul 69

Cystopteris x tennesseensis Shaver
(*C. fragilis* x *C. bulbifera*)
Tennessee Bladder Fern

Flora of
THE CATSKILLS
New York State

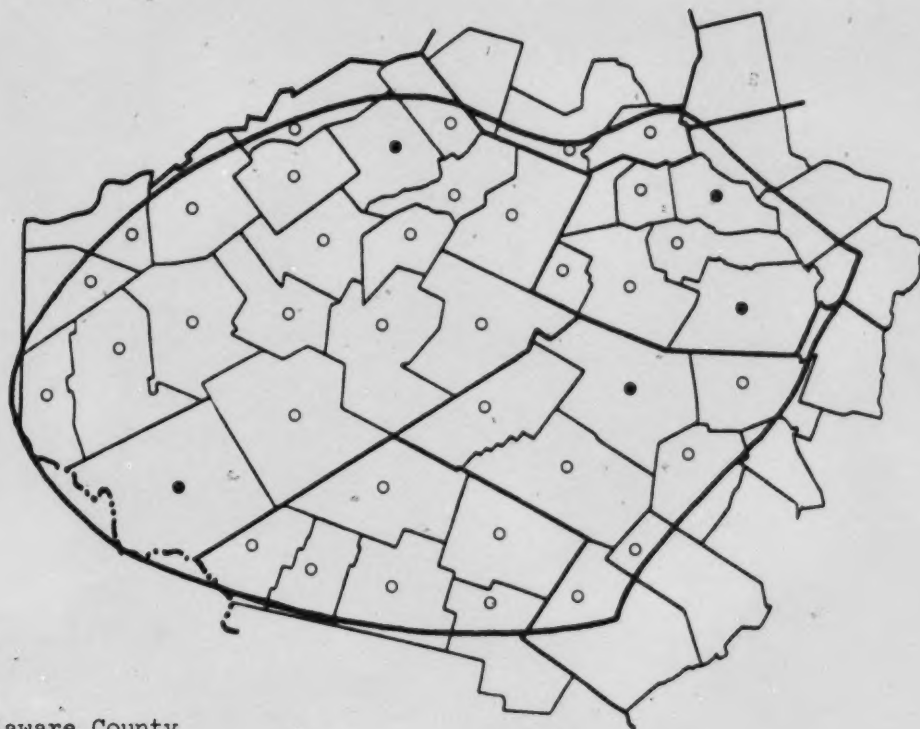


Greene County

Stony Clove, vic of Hunter, Town of Hunter
SJS obs 1 Sep 72

Dennatsedtia punctilobula (Michx.) Moore
Hay-scented Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Gould School, Town of Hancock

3498 E. Whitney 12 Jun 33--NYS

2 mi s of Grand Gorge, Town of Roxbury

Smith & Brooks obs 12 May 51

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

547 Brooks 21 Jul 51--Brooks

5 mi e of Delancey, Town of Delhi

KLB obs 30 May 52

Mt Utssyantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Margaretville, Town of Middletown

KLB obs 30 May 55

Dennstaedtia punctilobula

Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield

KLB obs 2 Jul 55

Merrill Farm, 2 mi s of Treadwell, Town of Franklin

KLB obs 10 Jul 59

Coe Hill Rd, 4 mi sw of Davenport, Town of Davenport

KLB obs 7 Aug 71

Spring Valley Rd, 3 mi se of Meridale, Town of Meredith

KLB obs 7 Aug 71

Feak Hollow Rd, 4 mi nw of Hamden, Town of Hamden

KLB obs 19 Aug 72

6 mi e of Downsville, Town of Colchester

KLB obs 12 Jun 73

Vic of Apex, Town of Tompkins

KLB obs 8 Jul 73

Vic of Beerston, Town of Walton

KLB obs 8 Jul 73

Vic of Silver L, Town of Deposit

KLB obs 31 Aug 75

3 mi nw of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

Vic of Sidney Center, Town of Sidney

KLB obs 7 Sep 75

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Onteora, Town of Hunter

Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul. 20: 466, 1893.

Windham, Town of Windham

1040 N. Taylor 09--NYS

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Haines Falls, Town of Hunter

E. R. Lippincott Jul 30--NYS; R. H. Torrey obs in Torreya 30: 24-25, 1930.

1/2 mi n of Bushnellsville, Town of Lexington

SJS obs 15 Jun 56

3 mi n of Halcott Center, Town of Halcott

KLB obs 31 May 75

Vic of Beaches Corners, Town of Jewett

KLB obs 4 Jul 75

Vic of E. Ashland, Town of Ashland

KLB obs 4 Jul 75

Schoharie County

Vic of W. Conesville, Town of Conesville

KLB obs 14 Sep 75

Vic of S. Gilboa, Town of Gilboa

KLB obs 22 Sep 75

Dennstaedtia punctilobula

Sullivan County

Vic of Willowemoc, Town of Neversink

SJS obs 15 Aug 52

Between Jeffersonville & N. Branch, Town of Callicoon

SJS obs 20-22 Jun 56

4 mi ne of Long Eddy, Town of Fremont

SJS obs 7 Sep 56

1 mi sw of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

3 mi n of Woodbourne, Town of Fallsburg

KLB obs 2 Aug 76

Vic of Liberty, Town of Liberty

KLB obs 2 Aug 76

Ulster County

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

Sarah L. Zabriskie 1888--BKL; O. P. Medsger in Mem. Torr. Bot. Club 17:
294-300, 1917.

Shandaken, Town of Shandaken

M. F. Miller 20 Jul 1898--PENN, BKL; 216 Mary F. Miller 21 Jul 1899--NYS

Summit of Slide Mt, Town of Shandaken

18 N. Taylor 5 Sep 18 at 4220 ft--BKL

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

5 1/2 mi se of Margaretville, Town of Hardenburgh

KLB obs 4 Sep 72

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Vic of Frost Valley Camp, Town of Denning

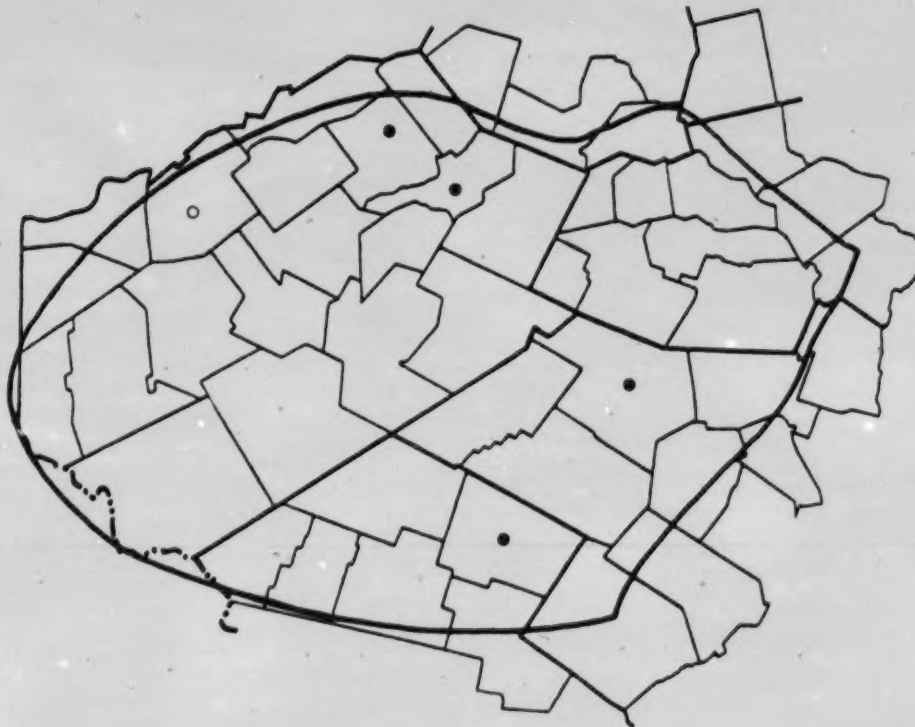
KLB obs 11 Jun 74

3 mi nw of Tabasco, Town of Rochester

KLB & Paul Huth obs 19 Aug 76

Dryopteris x boottii (Tuckerm.) Underw.
(*D. cristata* x *D. spinulosa*)
Boott's Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Ouleout Valley, s of Oneonta, Town of Franklin
G. Cleveland in Fern Bul. 16: 101-103, 1908.

Vic of Stamford, Town of Stamford

757 N. Taylor 09--NYS: 5769 P. Dowell 4 Jul 09 and 5819 P. Dowell 7 Jul
09--BKL (also reported in Am. Fern Jour. 1: 12-14, 1910.)

3 mi se of Doonan's Corners, Town of Kortright
1547 Brooks 14 Jun 52--Brooks, NYS

Sullivan County

Fir Brook Swamp, vic of Willowemoc, Town of Neversink
8256 S. J. Smith 10 May 50--NYS

(Continued on p. 226)

Dryopteris clintoniana (D. C. Eat.) Dowell
Clinton's Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Vic of Stamford, Town of Stamford

5772 P. Dowell 5 Jul 09 & 5820 P. Dowell 7 Jul 09--BKL (also reported
in Am. Fern Jour. 1: 12-14, 1910.)

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Dryopteris cristata (L.) Gray
Crested Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Stamford, Town of Stamford

5768B & 5816 P. Dowell 7 Jul 09--NYS

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

449 Brooks 8 Jul 51--Brooks, NYS: 3033 Brooks 6 Jul 54--NYS

3 mi se of Doonan's Corners, Town of Kortright

1548 Brooks 14 Jun 52--NYS

Rosa Farm, 1 mi s of Margaretville, Town of Middletown

KLB obs 9 Jul 72

Vic of Emmons Pond, Town of Davenport

KLB obs 14 Jul 74

1 1/2 mi s of Stratton Falls, Town of Roxbury

KLB obs 29 May 75

Dryopteris cristata

Coulter Brook, 2 mi s of Bovina, Town of Bovina
KLB obs 2 Jun 75

Greene County

4 mi e of Maplecrest, Town of Windham
SJS obs 11 Oct 52

Sullivan County

Fir Brook Swamp, vic of Willowemoc, Town of Neversink
8257 S. J. Smith 10 May 50--NYS

Ulster County

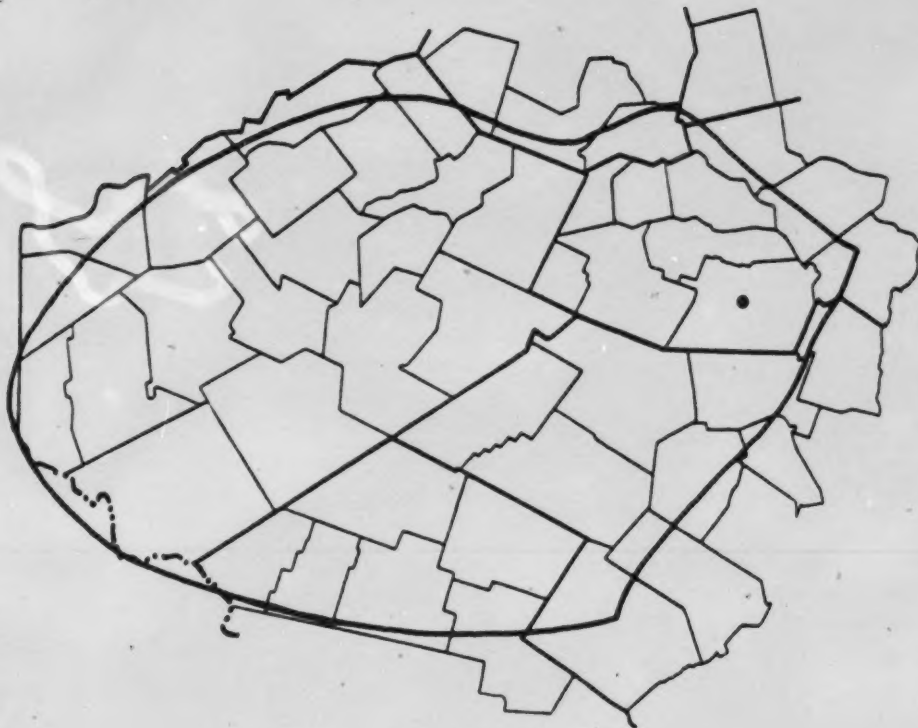
Shandaken, Town of Shandaken
168 Mary F. Miller 8 Aug 03--NYS
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock
894 M. Domville 19 Sep 70--Domville
Nedwidek Place, 4 mi sw of Winnisook, Town of Denning
KLB obs 25 Jun 75

Dryopteris x boottii (continued from p. 223)

Shandaken, Town of Shandaken
196 Mary F. Miller 19 Jul 02--NYS
Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
A. H. Graves quoting O. P. Medsger in Torreya 27: 14, 1927.

Dryopteris fragrans (L.) Schott
Fragrant Wood Fern

Flora of
THE CATSKILLS
New York State



Greene County

Haines Falls, Town of Hunter

E. M. Shields in Am. Fern Jour. 33: 57-59, 1943; G. R. Proctor in
Rhodora 49: 53-54, 1947 (specimen deposited in Phil.).

Hillyer Ravine, vic of Haines Falls, Town of Hunter

SJS and Phelps obs 27 May 65

Dryopteris goldiana (Hook.) Gray
Goldie's Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Griffins Corners [Fleischmanns], Town of Middletown

J. C. Buchheister in Fern Bul. 11: 15-16, 1903.

Vic of N. Franklin, Town of Franklin

G. Cleveland in Fern Bul. 16: 101-103, 1908.

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

P. Dowell in Am. Fern Jour. 1: 12-14, 1910; 36726 Smith et al. 10
Sep 69--NYS

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Cameron Farm, 6 mi nw of Andes, Town of Delhi

329 Brooks 25 Jun 51--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

440 Brooks 8 Jul 51--Brooks, NYS; 697 Brooks 26 Jul 51--Brooks, NYS

Vic of Emmons Pond, Town of Davenport

KLB obs 14 Jul 74

Dryopteris goldiana

Greene County

Vic of Deep Notch & Buck Creek, Town of Lexington

11473 E. P. Bicknell 14 Jun 1880--NYS

1 mi s of West Kill, Town of Lexington

6011 Brooks 13 Jun 74--NYS

Sullivan County

Vic of Willowemoc, Town of Neversink

A. P. Van Gieson Aug 1873--NYS

Ulster County

Vic of Big Indian, Town of Shandaken

11465 E. P. Bicknell Jun [1880]--NYS

Phoenicia, Town of Shandaken

C. N. Arnold Jul 1881--NYS

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917.

Mink Hollow, Town of Woodstock

H. Dunbar obs [n.d.]

Cystopteris bulbifera (continued from p. 216)

Ulster County

Shandaken, Town of Shandaken

M. F. Miller 20 Aug 02--BKL

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

A. H. Graves quoting O. P. Medsger in Torreya 27: 13-14, 1927.

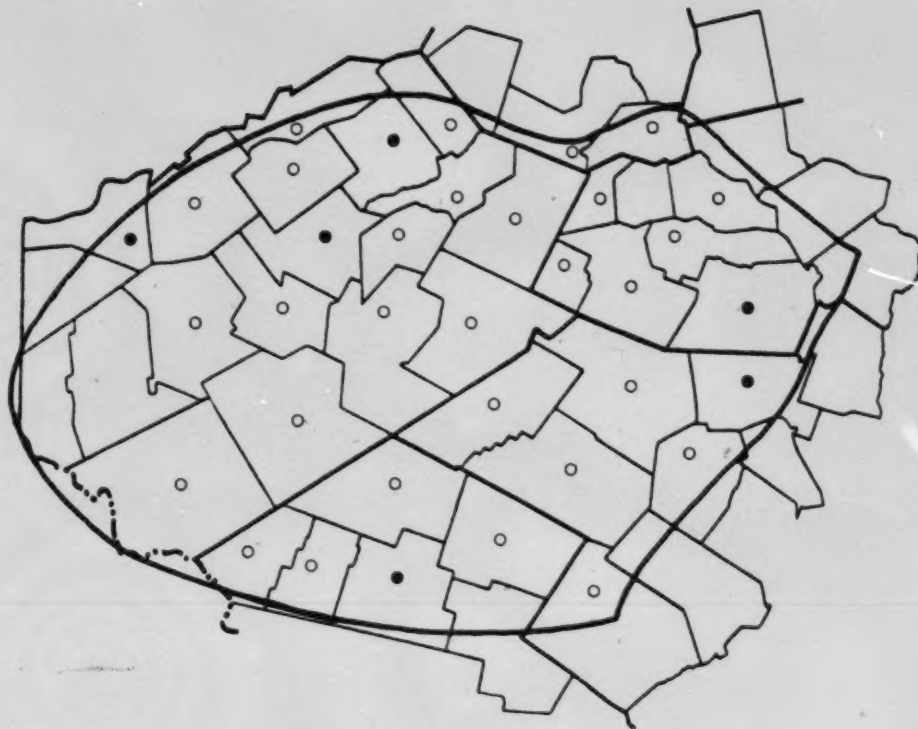
Cryptogramma stelleri (continued from p. 215)

Plattekill Clove [Platt Cove], Town of Hunter

Beach in Bul. N. Y. State Mus. 150: 39, 1912.

Dryopteris marginalis (L.) Gray
Marginal Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Near W. Kortright, Town of Kortright

5045 E. Whitney 17 Jun 36--NYS

Youngs, Town of Sidney

5068 & 5071 E. Whitney 19 Jun 36 -NYS

2 mi s of Grand Gorge, Town of Roxbury

Smith & Brooks obs 12 May 51

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

315 Brooks 24 Jun 51--Brooks, NYS; 701 Brooks 26 Jul 51--Brooks,

NYS; 4565 Brooks 6 Sep 59--Brooks, NYS (f. elegans)

Cameron Farm, 6 mi nw of Andes, Town of Delhi

390 Brooks 27 Jun 51--NYS

Point Mt, vic of Cadosia, Town of Hancock

SJS obs 17 Jun 54

Dryopteris marginalis

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Davenport Center, Town of Davenport

Smith & Brooks obs 7 Aug 54

Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield

KLB obs 2 Jul 55

Delhi, Town of Delhi

4565 Brooks 6 Sep 59--Brooks, NYS (f. *elegans*)

Merrill Farm, 2 mi s of Treadwell, Town of Franklin

KLB obs 10 Jul 59

Rosa Farm, 1 mi s of Margaretville, Town of Middletown

BW2-31 Brooks 4 Jul 66; BW4-06A Brooks 26 Aug 68

Gregorytown, Town of Colchester

KLB obs 3 Jul 71

Delancey, Town of Hamden

KLB obs 7 Aug 71

1 1/2 mi se of Walton, Town of Walton

KLB obs 28 Jul 74

2 mi s of E. Meredith, Town of Meredith

KLB obs 1 Aug 75

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Onteora, Town of Hunter

Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul. 20:

463, 1893.

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Haines Falls, Town of Hunter

E. R. Lippincott 1930-31--NYS

4 mi e of Maplecrest, Town of Windham

SJS obs 11 Oct 52

Elka Mt, vic of Tannersville, Town of Hunter

22737 S. J. Smith & Ellett 19 Jun 57--NYS

Deep Notch, vic of West Kill, Town of Lexington

SJS & Miller obs 12 Aug 61

Prattsville, Town of Prattsville

KLB obs 19 Jun 73

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

Vic of Beaches Corners, Town of Jewett

KLB obs 4 Jul 75

Schoharie County

Vic of Manorkill, Town of Conesville

KLB obs 1 Jul 75

Dryopteris marginalis

Vic of S. Gilboa, Town of Gilboa
KLB obs 22 Sep 75

Sullivan County

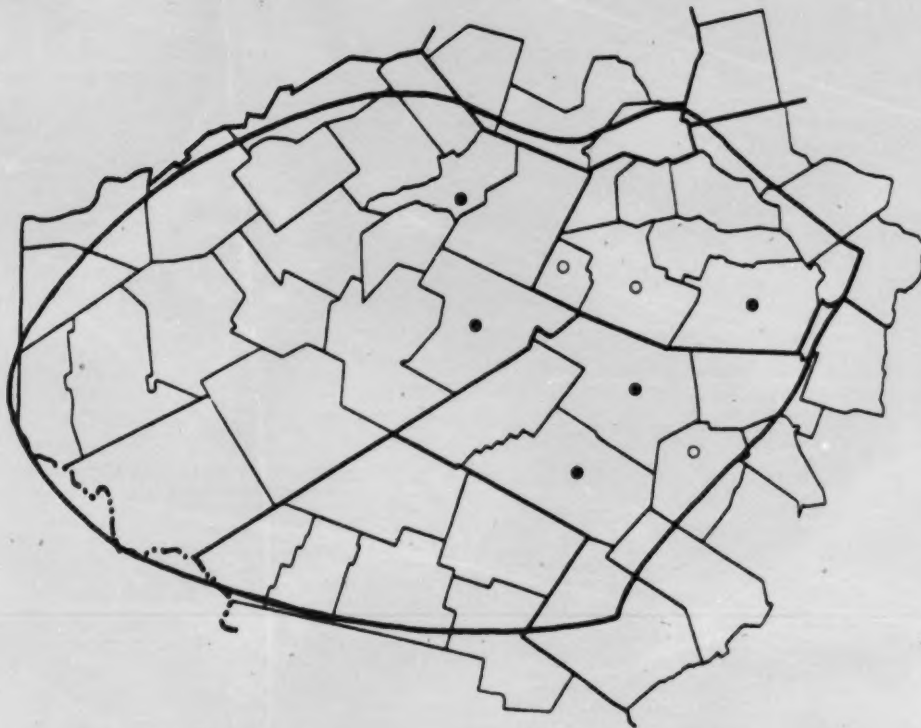
Dalilia School, nw of Liberty, Town of Liberty
4647 E. Whitney 31 Jul 35--NYS
S side of Rondout Reservoir, Town of Neversink
SJS obs 22 Jun 56
Vic of Obernburg, Town of Fremont
SJS obs 7-8 Sep 56
Beaverkill Campsite, Town of Rockland
KLB obs 3 Jun 74
4 mi n of Callicoon Center, Town of Callicoon
KLB obs 21 Jun 75

Ulster County

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
E. J. Alexander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.
Headwaters of Rondout Creek, Town of Denning
SJS obs 5 Sep 58
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock
880 M. Domville 12 Sep 70--Domville
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 5 Jun 74
1 mi ne of Dry Brook, Town of Hardenburgh
KLB obs 1 Jun 75

Dryopteris spinulosa (O. F. Muell.) Watt
ssp. *dilatata* (Hoffm.) Piper
Mountain Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Summit of Mt Utsayanthe, 1 1/2 mi e by s of Stamford, Town of Stamford
5801 P. Dowell 6 Jul 09 at 3214 ft--NY, NYS, BKL; 2978 Brooks 3 Jul 54
--Brooks, NYS

Rosa Farm, 1 mi s of Margaretville, Town of Middletown
5092 Brooks 9 Jul 72 in wooded swamp at 1400 ft--NYS

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.
Hunter, Town of Hunter

N. L. Britton 30 Jul 1898 & 1 Aug 1898--NY
Near summit of Hunter Mt, Town of Hunter
4605 H. K. Svenson 24 Aug 31--BKL (also reported in Torreya 31: 154-
157, 1931.)

Dryopteris spinulosa ssp. dilatata

Deep Notch, vic of West Kill, Town of Lexington

SJS obs 15 Jun 56

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

Ulster County

Catskill Mts of Ulster County

Peck [n.d.]--NYS

Dry Brook Mt, Town of Shandaken

F. C. Buchheister Aug 04 at 3500 ft--BKL

Slide Mt, Town of Shandaken

6707 M. S. Baxter 6 Aug 26--NYS, Baxter

Peekamoose, Town of Denning

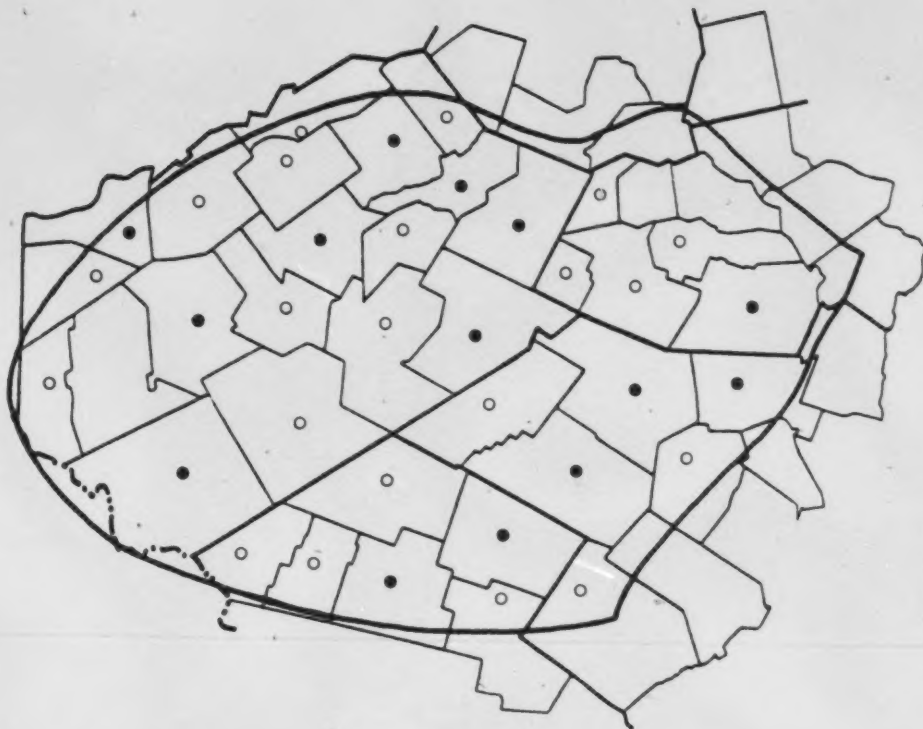
2033 M. Domville 10 Jul 73--Domville

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 75

Dryopteris spinulosa (O. F. Muell.) Watt
ssp. *intermedia* (Muhl.) Stone
Evergreen Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown

F. Mulford Jul 03--BKL

Vic of Stamford, Town of Stamford

5822 P. Dowell 7 Jul 09--BKL (also reported in Am. Fern Jour. 1: 12-14, 1910); 4424 E. Whitney 25 Jul 35--NYS

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Roxbury, Town of Roxbury

3449 E. Whitney 9 Jun 33--NYS

Gould School, Town of Hancock

3491 E. Whitney 12 Jun 33--NYS

Hotaling Hollow, Town of Delhi

4467 E. Whitney 26 Jul 35--NYS

Robinson L, vic of Delhi, Town of Delhi

4498 E. Whitney 26 Jul 35--NYS

Bear Spring Mt, vic of Walton, Town of Walton

4523 E. Whitney 27 Jul 35--NYS

Dryopteris spinulosa ssp. *intermedia*

Walton, Town of Walton

4525 E. Whitney 27 Jul 35--NYS

Vic of Youngs, Town of Sidney

5070 & 5072 E. Whitney 19 Jun 36--NYS

Bullet Hollow Rd, 5 mi nw of Andes, Town of Delhi

377 Brooks 26 Jun 51--NYS; 3107 Brooks 13 Jul 54--NYS

Cameron Farm, 6 mi nw of Andes, Town of Delhi

388 Brooks 26 Jun 51--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

296 Brooks 24 Jun 51--NYS; 540 Brooks 21 Jul 51--Brooks, NYS; 452

Brooks 8 Jul 51--NYS; 699 Brooks 26 Jul 51--NYS; 700 Brooks 26 Jul 51--NYS

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Merrill Farm, 2 mi s of Treadwell, Town of Franklin

KLB obs 10 Jul 59

6 mi e of Downsville, Town of Colchester

KLB obs 12 Jun 73

Vic of Emmons Pond, Town of Davenport

KLB obs 14 Jul 74

Basin Clove Rd, 1 1/2 mi s by e of Delancey, Town of Hamden

KLB obs 11 May 75

E. Meredith, Town of Meredith

KLB obs 1 Aug 75

Vic of Silver L, Town of Deposit

KLB obs 31 Aug 75

3 mi nw of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

Greene County

Onteora, Town of Hunter

Anna M. Vail, reported by J. K. Small in Torr. Club Bul. 20: 463, 1893.

N slope of Hunter Mt, Town of Hunter

4601 H. K. Svenson 24 Aug 31 at 2500 ft--BKL

Deep Notch, vic of West Kill, Town of Lexington

SJS & Miller obs 12 Aug 61

Prattsville, Town of Prattsville

KLB obs 19 Jun 73

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

Vic of Jewett, Town of Jewett

KLB obs 8 Jun 76

Sullivan County

W branch of Neversink, Town of Neversink

11458 E. P. Bicknell 16 Jun 1881--NYS

Vic of Liberty, Town of Liberty

4618 E. Whitney 30 Jul 35--NYS

Ne of Long Eddy, Town of Fremont

SJS obs 20-22 Jun 56

Dryopteris spinulosa ssp. *intermedia*

Beaverkill Campsite, Town of Rockland

KLB obs 3 Jun 74

4 mi n of Callicoon Center, Town of Callicoon

KLB obs 21 Jun 75

3 mi n of Woodbourne, Town of Fallsburg

KLB obs 2 Aug 76

Ulster County

Shandaken, Town of Shandaken

192 Mary F. Miller 21 Jul 1900--NYS: 18 Mary F. Miller 27 Aug 03 &
8 Sep 03--BKL

Summit of Slide Mt, Town of Shandaken

15 N. Taylor 5 Sep 18 at 4220 ft--BKL

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Peekamoose, Town of Denning

2032 M. Domville 10 Jul 73--Domville

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

2044 M. Domville 23 Aug 73--Domville

Vic of Hardenburgh, Town of Hardenburgh

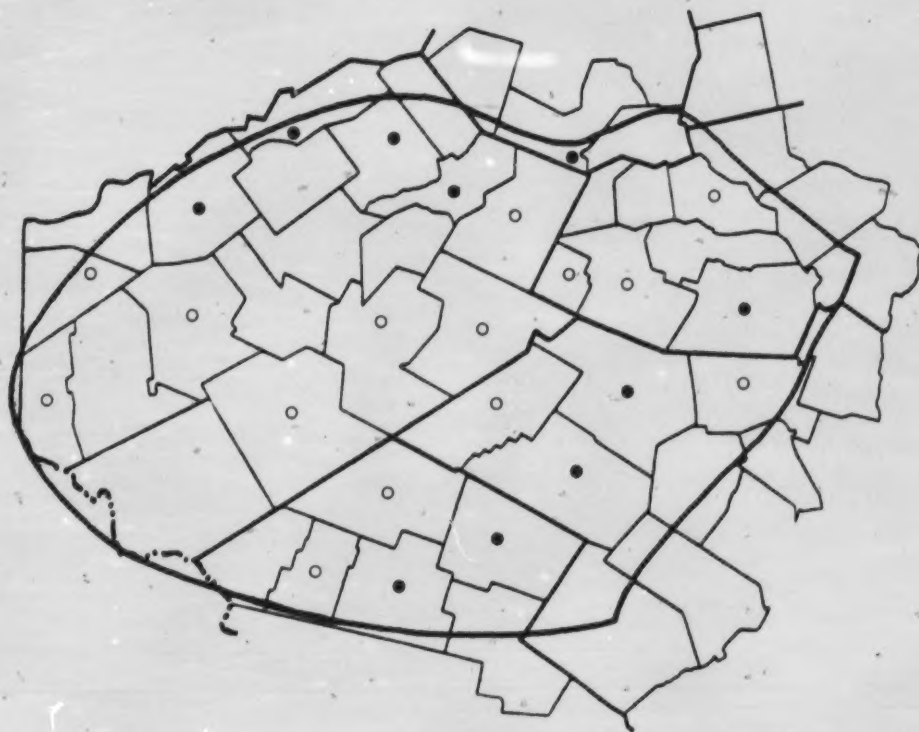
KLB obs 14 May 74

Vic of Boiceville, Town of Olive

KLB obs 23 Jul 74

Dryopteris spinulosa (O. F. Muell.) Watt
ssp. *spinulosa*
Spinulose Wood Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Stamford, Town of Stamford
5822 P. Dowell 9 Jul 09--NYS
S of Davenport, Town of Davenport
5032 E. Whitney 17 Jun 36--NYS
W of Kortright, Town of Kortright
5041 E. Whitney 17 Jun 36--NYS
2 mi s of Grand Gorge, Town of Roxbury
Smith & Brooks obs 12 May 51
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
666 Brooks 25 Jul 51--Brooks, NYS; 296 Brooks 24 Jun 51--NYS
1/2 mi w by s of W. Harpersfield, Town of Kortright
4102 Brooks 9 Jun 56
Cold Spring Hollow, 3 1/2 mi s by e of Margaretville, Town of Middletown
KLB obs 28 Jul 73
1 mi e of Tompkins Falls, Town of Andes
KLB obs 13 Jul 74

Dryopteris spinulosa ssp. *spinulosa*

Vic of Russ Gray Pond, Town of Walton

KLB obs 29 Jun 75

Vic of Silver Lake, Town of Deposit

KLB obs 31 Aug 75

Mormon Hollow Rd, 3 mi w of Trout Creek, Town of Masonville

KLB obs 7 Sep 75

5 mi ne of Butternut Grove, Town of Colchester

KLB obs 15 Jun 76

Storey Farm, 6 mi se of Franklin, Town of Franklin

6219 Brooks 20 Jun 76--NYS

Greene County

Catskill Mt House, Otis Summit, Town of Hunter

Mrs. Chas. Beach [n.d.]--St. Lawrence

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5; 38-39, 1874.

Onteora, Town of Hunter

Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul.

20: 463, 1893.

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

4 mi e of Maplecrest, Town of Windham

SJS obs 11 Oct 52

3 mi e of West Kill, Town of Lexington

KLB obs 13 Jun 74

Elk Creek Rd, 2 mi ne of Halcott Center, Town of Halcott

KLB obs 18 Jun 75

Schoharie County

S. Gilboa Station, Town of Gilboa

5833 P. Dowell 9 Jul 09--NYS

Sullivan County

Dalilia School, nw of Liberty, Town of Liberty

4651 E. Whitney 31 Jul 35--NYS

Fir Brook Swamp, ne of Willowemoc, Town of Neversink

8254 S. J. Smith 5 Oct 50--NYS

1 1/2 mi sw of Lew Beach, Town of Rockland

KLB obs 15 Jun 76

3 mi s by w of Livingston Manor, Town of Callicoon

KLB obs 15 Jun 76

Ulster County

Shandaken, Town of Shandaken

181 Mary F. Miller 9 Sep 03--NYS

W branch of Neversink, Town of Denning

11458 E. P. Bicknell 16 Jun 1881--NYS

Dryopteris spinulosa ssp. *spinulosa*

Woodland Valley, 4 mi e of Phoenicia, Town of Shandsken

O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917; E. J. Alexander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.

Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock

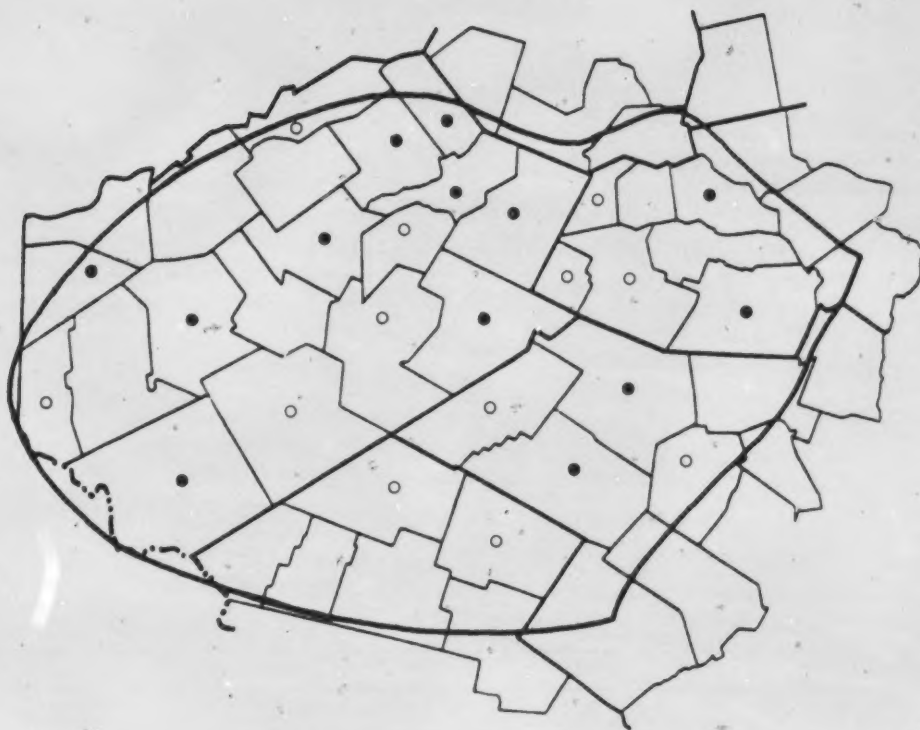
KLB & Mary Domville obs 26 Aug 72

Vic of Bell Ayre Village, Town of Hardenburgh

KLB obs 8 Jul 75

Gymnocarpium dryopteris (L.) Newm.
Oak Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown
E. N. Harvey [1905]--NY
N of Stamford, Town of Stamford
5763 P. Dowell [9 Jul 09]--BKL
Stamford, Town of Stamford
P. Dowell in Am. Fern Jour. 1: 12-14, 1910.
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
N. Hotchkiss obs 10 May 27
Hubbels Cove, Town of Roxbury
962 E. Whitney 2 Jun 30--NYS
Gould School, Town of Hancock
3502 E. Whitney 12 Jun 33--NYS
Se of Stamford, Town of Harpersfield
4425 E. Whitney 27 Jul 35--NYS

Gymnocarpium dryopteris

Colchester, Town of Walton

4532 E. Whitney 27 Jul 35--NYS

E. Masonville, Town of Masonville

5104 E. Whitney 19 Jun 36--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

293 Brooks 24 Jun 51--NYS; 376 Brooks 26 Jun 51--Brooks, NYS:

2742 Brooks 30 May 54--Brooks

Bullet Hollow Rd, 5 mi nw of Andes, Town of Delhi

376 Brooks 26 Jun 51--Brooks, NYS

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Davenport Center, Town of Davenport

Smith & Brooks obs 17 Aug 54

Vic of Downsville, Town of Colchester

KLB obs 30 May 74

Vic of Silver L, Town of Deposit

KLB obs 31 Aug 75

Greene County

Big Hollow [Maplecrest], Town of Windham

2328 Barnhart [n.d.]--NY

Stony Clove, vic of Hunter, Town of Hunter

Peck [n.d.]--NYS; S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 58, 1874.

Onteora, Town of Hunter

Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul.

20: 461, 1893.

Haines Falls, Town of Hunter

E. R. Lippincott Jul 31--NYS

Deep Notch, vic of West Kill, Town of Lexington

SJS obs 15 Jun 56

3 mi n of Halcott, Center, Town of Halcott

KLB obs 31 May 75

Prattsville, Town of Prattsville

KLB obs 4 Jul 75

Sullivan County

1 mi sw of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

2 1/2 mi s of Claryville, Town of Neversink

KLB obs 10 Jun 75

Ulster County

Pine Hill, Town of Shandaken

11439 E. P. Bicknell Jun 1880--NYS

(Continued on p. 250)

Matteuccia struthiopteris (L.) Todaro
Ostrich Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Griffins Corners [Fleischmanns], Town of Middletown

J. C. Buchheister in Fern Bul. 11: 15-16, 1903.

Arkville, Town of Middletown

F. Mulford Jul 03--BKL; E. N. Harvey [1905]--NY; P. Wilson 17 Jul 15--NY

Stamford, Town of Stamford

P. Dowell in Am. Fern Jour. 1: 12-14, 1910.

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Hubbells Cove, Town of Roxbury

963 E. Whitney 2 Jun 30--NYS

Gould School, Town of Hancock

3497 E. Whitney 12 Jun 33--NYS

Walton, Town of Walton

4522 E. Whitney 27 Jul 35--NYS

Matteuccia struthiopteris

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

665 Brooks 25 Jul 51--NYS, Brooks

Fraser, Town of Delhi

T114 Brooks 16 Apr 66

Vic of Downsville, Town of Colchester

KLB obs 30 May 74

Vic of Hawleys, Town of Hamden

KLB obs 28 Jul 74

East Meredith, Town of Meredith

KLB obs 4 Jun 76

Greene County

Stony Clove, vic of Hunter, Town of Hunter

Peck 1870 (Notes 2: 236); S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

3 mi e of West Kill, Town of Lexington

KLB obs 13 Jun 74

3 mi n of Halcott Center, Town of Halcott

KLB obs 31 May 75

Vic of Jewett, Town of Jewett

KLB obs 8 Jun 76

Vic of Ashland, Town of Ashland

KLB obs 8 Jun 76

Schoharie County

S. Gilboa Station, Town of Gilboa

5837 P. Dowell 9 Jul 09--BKL

Sullivan County

1 mi sw of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

4 mi n of Callicoon Center, Town of Callicoon

KLB obs 21 Jun 75

Vic of Long Eddy, Town of Fremont

KLB & Phil Caswell obs 14 Sep 78

Ulster County

Phoenicia, Town of Shandaken

J. M. MacFarlane Jul-Aug 07--PENN

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917; A. H. Graves quoting O. P. Medsger in Torreya 27: 13-14, 1927.

Headwaters of Rondout Creek, Town of Denning

SJS obs 5 Sep 58

Dry Brook, Town of Hardenburgh

KLB obs 28 May 74

Vic of Willow, Town of Woodstock

KLB obs 26 May 76

Onoclea sensibilis L.
Sensitive Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Delhi, Town of Delhi

N. Hotchkiss obs 10 May 27

Masonville, Town of Masonville

5113 E. Whitney 19 Jun 36--NYS

2 mi s of Grand Gorge, Town of Roxbury

Smith & Brooks obs 12 May 51

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

286 Brooks 23 Jun 51--Brooks, NYS: 549 Brooks 21 Jul 51--Brooks, NYS

Point Mt, near Cadosia, Town of Hancock

SJS obs 17 Jun 54

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

W. Harpersfield, Town of Harpersfield

KLB obs 3 Jul 54

Onoclea sensibilis

- Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina
KLB obs 14 Jul 54
Davenport Center, Town of Davenport
Smith & Brooks obs 7 Aug 54
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
Gregorytown, Town of Colchester
KLB obs 3 Jul 71
Rosa Farm, 1 mi s of Margaretville, Town of Middletown
BW9-09 & BW9-15 Brooks 2 Oct 71
Vic of Meridale, Town of Meredith
KLB obs 7 Jul 73
Vic of Fishs Eddy, Town of Hancock
KLB obs 8 Jul 73
2 1/2 mi n by e of Delancey, Town of Hamden
KLB obs 14 Jul 73
Vic of Launt Pond, Town of Walton
KLB obs 28 Jul 74
3 mi s of Deposit, Town of Deposit
KLB obs 10 Aug 75
7 mi e by n of Deposit, Town of Tompkins
KLB obs 10 Aug 75
Vic of Sidney Center, Town of Sidney
KLB obs 6 Jul 76

Greene County

- Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.
Onteora, Town of Hunter
Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul.
20: 464, 1893.
Stony Clove, vic of Hunter, Town of Hunter
S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.
2 mi n of Halcott Center, Town of Halcott
KLB obs 25 Jun 73
4 mi e of West Kill, Town of Lexington
KLB obs 13 Sep 73
3 mi e of Jewett Center, Town of Jewett
KLB obs 10 Sep 74
Vic of Prattsville, Town of Prattsville
KLB obs 1 Jul 75
2 mi n by e of Ashland, Town of Ashland
KLB obs 4 Jul 75
2 mi n of Windham, Town of Windham
KLB obs 21 Jul 75

Schoharie County

- Vic of Conesville, Town of Conesville
KLB obs 1 Jul 75

Onoclea sensibilis

Vic of S. Gilboa, Town of Gilboa
KLB obs 22 Sep 75

Sullivan County

Krom Hollow, n of Liberty, Town of Liberty
4554 E. Whitney 29 Jul 35--NYS
E side of Long Eddy, Town of Fremont
SJS obs 7 Sep 56
Vic of Willowemoc, Town of Neversink
A. P. Van Gieson Aug 73--NYS
1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74
4 mi n of Callicoon Center, Town of Callicoon
KLB obs 21 Jun 75
3 mi n of Woodbourne, Town of Fallsburg
KLB obs 2 Aug 76

Ulster County

Shandaken, Town of Shandaken
M. F. Miller 29 Jul 1898--PENN
Pantherkill Valley, Town of Shandaken
J. M. MacFarlane Jul-Aug 07--PENN
Vic of Phoenicia, Town of Shandaken
J. F. MacFarlane 15 Aug 07--PENN
Headwaters of Rondout Creek, Town of Denning
SJS obs 5 Sep 58
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Overlook Mt, Town of Woodstock
KLB & Mary Domville obs 12 Jul 70
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 18 Jul 73
Vic of Hardenburgh, Town of Hardenburgh
KLB obs 14 May 74
3 mi nw of Tabasco, Town of Rochester
KLB & Paul Huth obs 19 Aug 76

Polypodium vulgare L.
ssp. *virginianum* (L.) Hult.
Rock Polypody

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin
M. Platt, 1840
Hancock, Town of Hancock
E. G. Knight 1874--NY
Arkville, Town of Middletown
E. N. Harvey Jul 05--NY, PENN: P. Wilson 3 Jul 15--NY
N. Franklin, Town of Franklin
G. T. Cleveland 1 Aug 07--NY
Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford
N. Taylor 3-10 Jul 09--NY
Bald Hill, vic of Stamford, Town of Stamford
5785 P. Dowell 5 Jul 09--BKL
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
N. Hotchkiss obs 10 May 27

Polypodium vulgare ssp. *virginianum*

Gould School, Town of Hancock,

3508 E. Whitney 12 Jun 33--NYS

Meridale, Town of Meredith

4461 E. Whitney 26 Jul 35--NYS

Vic of Youngs, Town of Sidney

5079 E. Whitney 19 Jun 36--NYS

2 mi s of Grand Gorge, Town of Roxbury

9236 Smith et al. 12 May 51--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

522 Brooks 21 Jul 51--Brooks, NYS

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Gregorytown, Town of Colchester

KLB obs 3 Jul 71

Gregory Hollow Rd, 4 mi s by e of Delancey, Town of Hamden

KLB obs 11 May 75

Greene County

Catskill Mt House, Otis Summit, Town of Hunter

Mrs. Chas. Beach [n.d.]--St. Lawrence

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Onteora, Town of Hunter

Anna M. Vail Sep 1891 at 2100 ft--NY; J. K. Small in Torr. Club Bul.

20: 458, 1893; 2324 Barnhart 11 Aug 1897--NY

Windham, Town of Windham

929 N. Taylor 28-31 Jul 09 at 1700 ft--NY

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Haines Falls, Town of Hunter

F. W. Kolbe 26 Aug 21--NY; E. R. Lippincott Jul 31--NYS

Kaaterskill Falls, Town of Hunter

12139 S. J. Smith & Ogden 16 Sep 52--NYS

Deep Notch, vic of West Kill, Town of Lexington

SJS obs 15 Jun 56

Schoharie County

Vic of West Conesville, Town of Conesville

KLB obs 1 Jul 75

Sullivan County

L Shandelea, Town of Callicoon

P. Wilson 8 Aug 18--NY

Dalilia School, nw of Liberty, Town of Liberty

4652 E. Whitney 31 Jul 35--NYS

ne of Long Eddy, Town of Fremont

SJS obs 20-22 Jun 56

Beaverkill Campsite, Town of Rockland

KLB obs 3 Jun 74

Polypodium vulgare ssp. *virginianum*

Ulster County

Shandaken, Town of Shandaken

58 Miller 4 Jul 01--NYS; 59 Miller 30 Aug 01--NYS; 60 Miller 8 Aug
02--NYS; C. Willis 30 Jul 01--NY

Pantherkill Valley, Town of Shandaken

J. M. MacFarlane 16 Aug 07--NYS

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917; E. J. Alex-
ander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Peekamoose, Town of Denning

2031 M. Domville 10 Jul 73--Domville

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

Gymnocarpium dryopteris (continued from p. 242)

Shandaken, Town of Shandaken

M. F. Miller 2 Jul 1898--PENN; 202 M. F. Miller 10 Jun 1900--NYS

Wagon Wheel Gap, e slope of High Point, Town of Olive

R. H. Torrey in Torrey 31: 123, 1931.

Phoenicia, Town of Shandaken

3462 E. Whitney 10 Jun 33--NYS

Peekamoose, Town of Denning

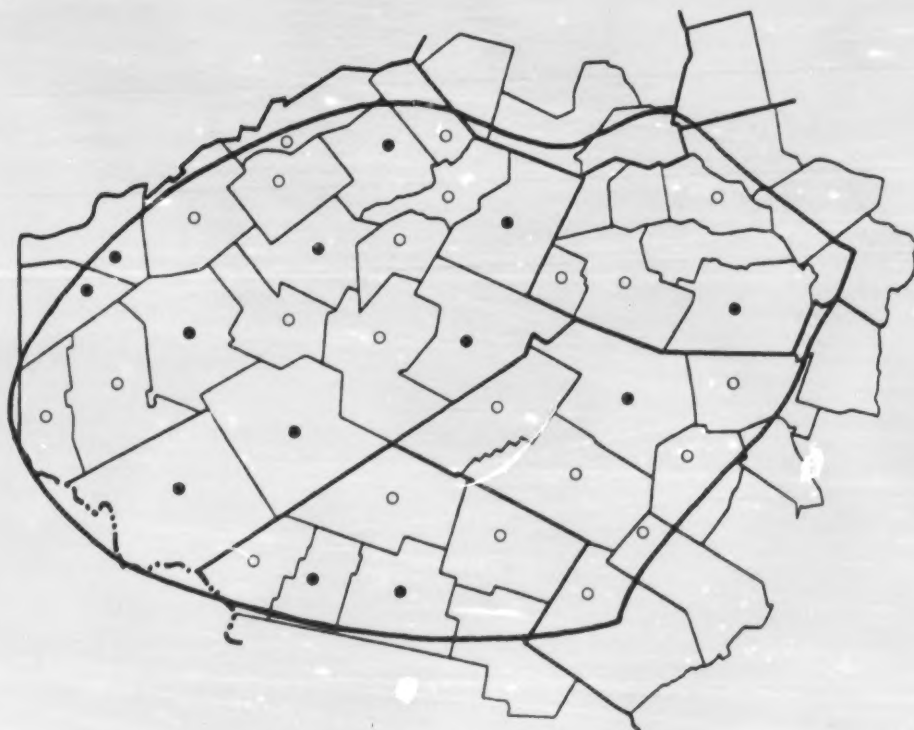
1041 M. Domville 12 Jul 71--Domville

2 mi e of Turnwood, Town of Hardenburgh

KLB obs 31 May 76

Polystichum acrostichoides (Michx.) Schott
Christmas Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Arkville, Town of Middletown
E. N. Harvey [1905]--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
N. Hotchkiss obs 10 May 27
Roxbury, Town of Roxbury
3452 E. Whitney 9 Jun 33--NYS
Gould School, Town of Hancock
3500 E. Whitney 12 Jun 33--NYS
Downsville, Town of Colchester
3512 E. Whitney 12 Jun 33--NYS
Robinson L, w of Delhi, Town of Delhi
4483 & 4484 E. Whitney 26 Jul 35--NYS
Walton, Town of Walton
4514 E. Whitney 27 Jul 35--NYS

Polystichum acrostichoides

Youngs, Town of Sidney

5067 E. Whitney 19 Jun 36--NYS

E. Masonville, Town of Masonville

5093 E. Whitney 19 Jun 36--NYS

Bullet Hollow Rd, 5 mi nw of Andes, Town of Delhi

375 Brooks 26 Jun 51--Brooks, NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

443 Brooks 8 Jul 51--NYS; 2744 Brooks 30 May 54--Brooks, NYS

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield

KLB obs 2 Jul 55

Delancey, Town of Hamden

KLB obs 7 Aug 71

E. Meredith, Town of Meredith

KLB obs 1 Aug 75

Vic of Chamberlain Brook, Town of Tompkins

KLB obs 31 Aug 75

4 mi sw of Trout Creek, Town of Deposit

KLB obs 7 Sep 75

1/2 mi e of Davenport, Town of Davenport

KLB obs 30 Sep 75

Storey Place, 6 mi se of Franklin, Town of Franklin

KLB obs 20 Jun 76

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Onteora, Town of Hunter

Anna M. Vail at 2000 ft, reported by J. K. Small in Torr. Club Bul.

20: 464, 1893.

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Haines Falls, Town of Hunter

E. R. Lippincott Jul 31, Jul 32, Jul 33--NYS

4 mi e of Maplecrest, Town of Windham

SJS obs 11 Oct 52

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

1 mi s of West Kill, Town of Lexington

KLB obs 13 Jun 74

Sullivan County

Dalilia School, nw of Liberty, Town of Liberty

4650 E. Whitney 31 Jul 35--NYS

S side of Rondout Reservoir, Town of Neversink

SJS obs 22 Jun 56

Polystichum acristichoides

1 mi sw of Lew Beach, Town of Rockland

KLB obs 3 Jun 74

Vic of Obernburg, Town of Fremont

KLB obs 21 Jun 75

Ulster County

Shandaken, Town of Shandaken

M. F. Miller Aug 1898--PENN

Vic of Oliveria, Town of Shandaken

N. Taylor 6-9 Sep 18 at 2000-2500 ft--BKL

Phoenicia, Town of Shandaken

3461 E. Whitney 10 Jun 33--NYS

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

E. J. Alexander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.

Headwaters of Rondout Creek, Town of Denning

SJS obs 12 Sep 59

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Friedberg Place, 1 mi sw of Boiceville, Town of Olive

KLB & Claire Friedberg obs 18 Jul 73

Trail to Balsam Mt, 6 mi s by e of Arkville, Town of Hardenburgh

KLB obs 18 May 74

3 mi nw of Tabasco, Town of Rochester

KLB & Paul Huth obs 19 Aug 76

Polystichum braunii (Spenner) Fée
ssp. *purshii* (Fern.) Calder &
Braun's Holly Fern Taylor

Flora of
THE CATSKILLS
New York State



Delaware County

Griffins [Fleischmanns], Town of Middletown
Peck in 31st Annual Rept, p. 53, 1879.

Arkville, Town of Middletown

E. N. Harvey [1905]--NY; P. Wilson 21 Jul 15--BKL

Mt Pakatakan, vic of Margaretville, Town of Middletown

F. Mulford 6 Sep 08--BKL (a colony of about 30 plants)

s of Bagley Brook, 5 mi e of Delancey, Town of Delhi

1439 Brooks 30 May 52--Brooks, NYS

Cold Spring Hollow, 3 1/2 mi s by e of Margaretville, Town of Middletown

5150 Brooks 28 Jul 73--NYS

Greene County

Stony Clove, vic of Hunter, Town of Hunter

J. H. Redfield [n.d.]--NY; Peck in N. Y. State Mus. Rept. 24: 101,
1872; C. Lown Aug 1879--NYS; S. H. Burnham in Am. Fern Jour. 4: 1-5,
1914.

Polystichum braunii ssp. *purshii*

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38, 1874.

Bushnellsville Clove or Deep Hollow, Town of Lexington

Mary & Caroline Redfield 15 Aug 1879--NY (also reported in Bul. Torr. Bot. Club 6: 331, 1879.)

Deep Notch, vic of West Kill, Town of Lexington

11401 E. P. Bicknell 14 Jun 1880--NYS; S. H. Burnham quoting N. Y. State Mus. Rept. 26: 89, 1874 in Am. Fern Jour. 4: 1-5, 1914; 44262 S. J. Smith 15 May 69--NYS

Lanesville, Town of Hunter

G. VanIngen 1887--Rochester Acad.

Haines Falls, Town of Hunter

E. R. Lippincott Jul 31--NYS

Hunter Mt, Town of Hunter

4597 H. K. Svenson 24 Aug 31--BKL (also reported in Torreya 31: 155, 1931.)

Black Dome, Town of Jewett

119 R. McVaugh 20 Sep 32--PENN

Ulster County

Big Indian, Town of Shandaken

Peck in N. Y. State Mus. Rept. 31: 53, 1879.

Phoenicia, Town of Shandaken

C. Arnold Jul 1881--NYS

Shandaken, Town of Shandaken

M. F. Miller 7 Oct 1899--PENN; 147 M. F. Miller 21 Aug 02--NYS

Belle Ayre Mt, Town of Shandaken

J. C. Buchheister 30 Jul 1899 in Am. Fern Jour. 4: 1, 1914.

Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken

F. Mulford 1 Jun 01--BKL; O. P. Medsger in Mem. Torr. Bot. Club 17: 294-300, 1917; A. H. Graves quoting O. P. Medsger in Torreya 27: 13-14, 1927.

Pantherkill Valley, Town of Shandaken

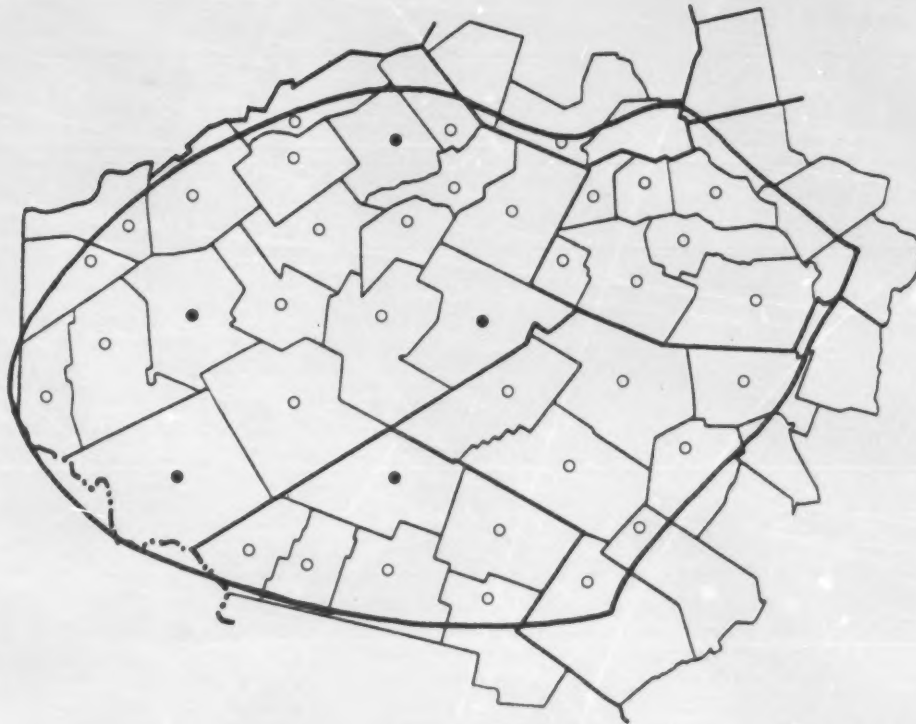
J. M. MacFarlane [07]--NY

Olive Denning Pass, Town of Denning

403 H. Dunbar 12 Sep 54--NYS

Pteridium squilinum (L.) Kuhn
ssp. *latiusculum* (Desv.) Hult.
Bracken

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin
M. Platt, 1840
Arkville, Town of Middletown
E. N. Harvey [1905]--NY; P. Wilson [1915]--NY
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
N. Hotchkiss obs 10 May 27
Gould School, Town of Hancock
3497 E. Whitney 12 Jun 33--NYS
Walton, Town of Walton
4522 E. Whitney 27 Jul 35--NYS
Vic of Grand Gorge, Town of Roxbury
SJS obs 19 Apr 51
Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright
311 Brooks 24 Jun 51--Brooks, NYS

Pteridium aquilinum ssp. *latiusculum*

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina
KLB obs 14 Jul 54
Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield
KLB obs 3 Jul 55
S of Shinhopple, Town of Colchester
SJS obs 10 Aug 55
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
Coe Hill Rd, 4 mi sw of W. Davenport, Town of Davenport
KLB obs 7 Aug 71
Delancey, Town of Hamden
KLB obs 7 Aug 71
Narrow Notch Rd, 6 mi se of Hobart, Town of Stamford
KLB obs 20 Aug 72
Vic of Apex, Town of Tompkins
KLB obs 8 Jul 73
Warner Hill Rd, 3 mi w of Meridale, Town of Meredith
KLB obs 14 Jul 74
Vic of Silver L, Town of Deposit
KLB obs 31 Aug 75
Vic of Sidney Center, Town of Sidney
KLB obs 7 Sep 75
2 mi n of Trout Creek, Town of Masonville
KLB obs 7 Sep 75

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.
Stony Clove, vic of Hunter, Town of Hunter
S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.
4 mi e of Maplecrest, Town of Windham
SJS obs 11 Oct 52
Prattsville, Town of Prattsville
KLB obs 19 Jun 73
2 mi n of Halcott Center, Town of Halcott
KLB obs 25 Jun 73
4 mi e of West Kill, Town of Lexington
KLB obs 13 Sep 73
2 mi s of Jewett, Town of Jewett
KLB obs 1 Jul 75
2 mi n by e of Ashland, Town of Ashland
KLB obs 4 Jul 75

Schoharie County

Vic of S. Gilboa, Town of Gilboa
KLB obs 22 Sep 75

Pteridium aquilinum ssp. *latiusculum*

Sullivan County

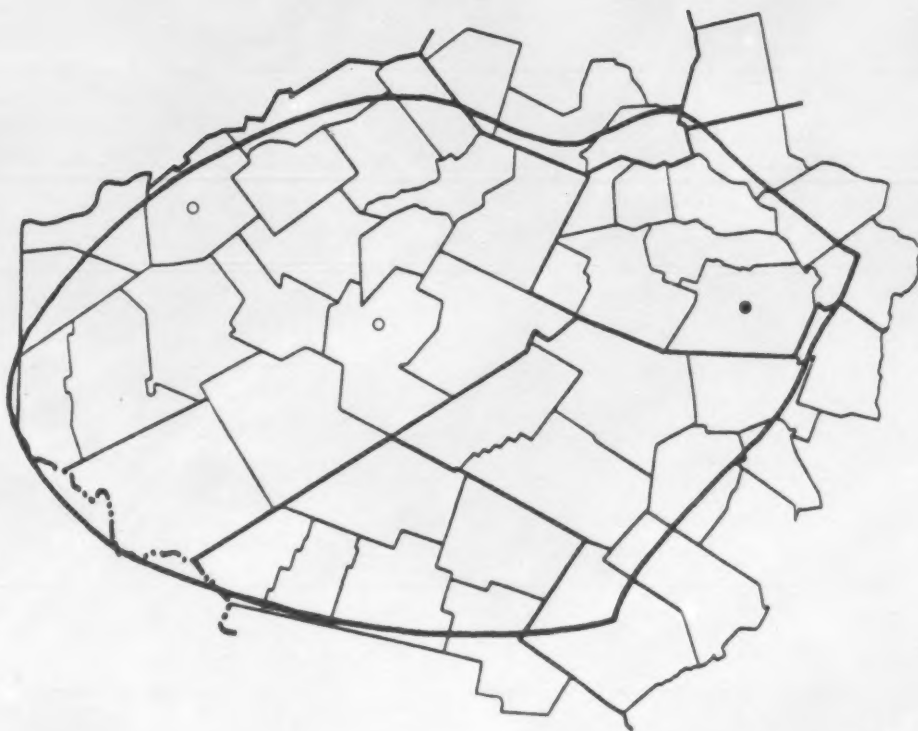
Livingston Manor, Town of Rockland
E. Dressel 15 Jul 44--CU
Between Jeffersonville & N. Branch, Town of Callicoon
SJS obs 20-22 Jun 56
S side of Rondout Reservoir, Town of Neversink
SJS obs 22 Jun 56
Vic of Lakewood, Town of Fremont
KLB obs 21 Jun 75
Vic of Liberty, Town of Liberty
KLB obs 28 Jul 75
Vic of Loch Sheldrake, Town of Fallsburg
KLB obs 2 Aug 76

Ulster County

Vic of Olivera, Town of Shandaken
SJS obs 9 Jun 54
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Wilson State Park, 3 mi sw of Bearsville, Town of Woodstock
KLB & Mary Domville obs 26 Aug 72
5 1/2 mi se of Margaretville, Town of Hardenburgh
KLB obs 4 Sep 72
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 18 Jul 73
Vic of Frost Valley Camp, Town of Denning
KLB obs 11 Jun 74
3 mi nw of Tabasco, Town of Rochester
KLB & Paul Huth obs 19 Aug 76

Thelypteris hexagonoptera (Michx.) Weatherby
Broad Beech Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Greene County

Catskill Mt House, Otis Summit, Town of Hunter

Mrs. Chas. Beach [n.d.]--St. Lawrence

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.

Thelypteris noveboracensis (L.) Nieuwl.
New York Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Gould School, Town of Hancock

3496 E. Whitney 12 Jun 33--NYS

Robinson L, w of Delhi, Town of Delhi

4478 E. Whitney 26 Jul 35--NYS

Bear Spring Mt, vic of Walton, Town of Walton

4520 E. Whitney 27 Jul 35--NYS

E. Masonville, Town of Masonville

5103 E. Whitney 19 Jun 36--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

539 Brooks 21 Jul 51--Brooks, NYS

Mt Utsayantha, 1 1/2 mi e by s of Stamford, Town of Stamford

KLB obs 3 Jul 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Thelypteris noveboracensis

Margaretville, Town of Middletown

KLB obs 30 May 55

Gunhouse Hill, 1 mi s of W. Harpersfield, Town of Harpersfield

KLB obs 2 Jul 55

Merrill Farm, 2 mi s of Treadwell, Town of Franklin

KLB obs 10 Jul 59

4 mi se of Downsville, Town of Colchester

KLB obs 12 Jun 73

1 1/2 mi e of Delancey, Town of Hamden

KLB obs 15 Jun 75

2 mi s of E. Meredith, Town of Meredith

KLB obs 1 Aug 75

4 mi sw of Trout Creek, Town of Deposit

KLB obs 7 Sep 75

1/2 mi s of Davenport, Town of Davenport

KLB obs 30 Sep 75

Campone Place, 1 mi e of Vega, Town of Roxbury

KLB obs 31 Jul 76

Vic of Apex, Town of Tompkins

KLB, Kathy Emerson, & Phil Caswell obs 30 Aug 78

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.

Onteora, Town of Hunter

Anna M. Vail, reported by J. K. Small in Torr. Club Bul. 20: 463, 1893.

Big Hollow [Maplecrest], Town of Windham

2337 Barnhart 11 Aug 1897--NY

Dibble Mt,

W. L. Bray Jul 14--Syracuse

2 mi n of Halcott Center, Town of Halcott

KLB obs 25 Jun 73

4 mi e of West Kill, Town of Lexington

KLB obs 13 Sep 73

Vic of Jewett, Town of Jewett

KLB obs 13 Sep 73

Schoharie County

Vic of S. Gilboa, Town of Gilboa

KLB obs 22 Sep 75

Sullivan County

Fox Mt, vic of Liberty, Town of Liberty

934 E. Whitney 31 May 30--NYS

Vic of Liberty, Town of Liberty

935 E. Whitney 31 May 30--NYS; 4617 E. Whitney 30 Jul 35--NYS

Fir Brook Swamp, vic of Willowemoc, Town of Neversink

SJS obs 10 May 50

Thelypteris noveboracensis

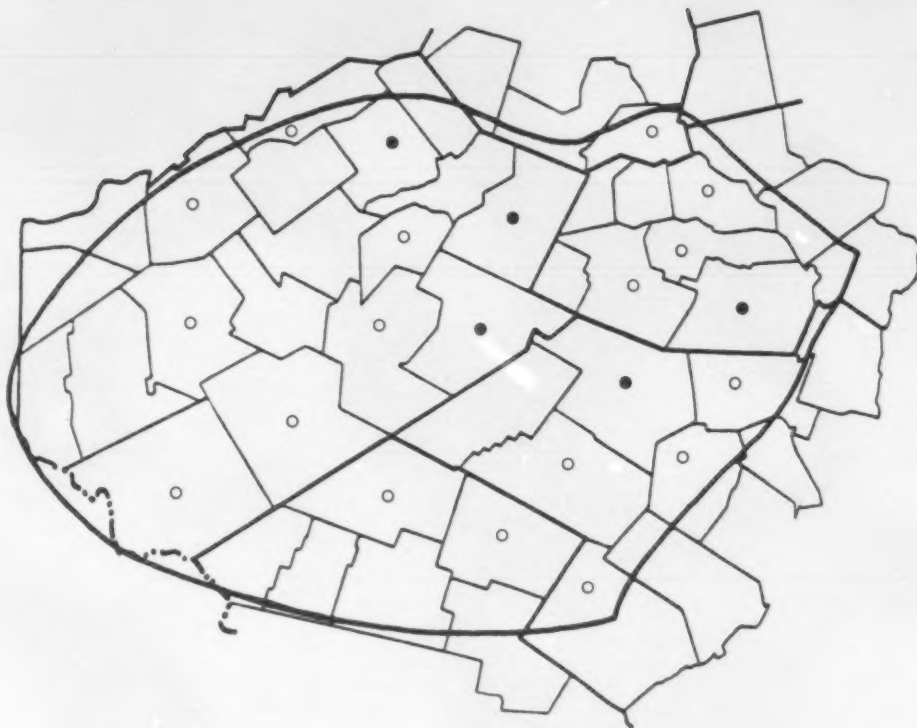
- 1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74
3 mi s by w of Livingston Manor, Town of Callicoon
KLB obs 15 Jun 76
Vic of Tennenah L, Town of Fremont
KLB obs 19 Jul 76
Vic of Loch Sheldrake, Town of Fallsburg
KLB obs 2 Aug 76

Ulster County

- Shandaken, Town of Shandaken
Jas. D. Lowe 29 Jul 1898--PENN
Woodland Valley, 4 mi e of Phoenicia, Town of Shandaken
E. J. Alexander in Jour. N. Y. Bot. Gard. 37: 42-46, 1936.
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Vic of Willow, Town of Woodstock
1061 M. Domville 10 Aug 70--Domville
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 18 Jul 73
Dry Brook, Town of Hardenburgh
KLB obs 28 May 74
Vic of Frost Valley Camp, Town of Denning
KLB obs 11 Jun 74
3 mi nw of Tabasco, Town of Rochester
KLB & Paul Huth obs 19 Aug 76

Thelypteris palustris Schott
ssp. *pubescens* (Lawson) Holub.
Marsh Fern

Flora of
THE CATSKILLS
New York State



Delaware County

Franklin, Town of Franklin

M. Platt, 1840

Griffins Corners [Fleischmanns], Town of Middletown

J. C. Buchheister in Fern Bul. 11: 15-16, 1903.

Arkville, Town of Middletown

E. N. Harvey [1905]--NY

Andes, Town of Andes

A. M. Taylor in Am. Fern Jour. 14: 87, 1924.

Roxbury, Town of Roxbury

3450 E. Whitney 9 Jun 33--NYS

Brookdale Farm, 3 mi s by w of W. Harpersfield, Town of Kortright

650 Brooks 24 Jul 51--Brooks, NYS

Point Mt, near Cadosia, Town of Hancock

SJS obs 17 Jun 54

Hoff Farm, 2 1/4 mi nw of Bovina Center, Town of Bovina

KLB obs 14 Jul 54

Thelypteris palustris ssp. *pubescens*

Davenport Center, Town of Davenport
Smith & Brooks obs 7 Aug 54
Merrill Farm, 2 mi s of Treadwell, Town of Franklin
KLB obs 10 Jul 59
4 mi se of Downsville, Town of Colchester
KLB obs 12 Jun 73
Strauss Farm, 4 1/2 mi ne of Walton, Town of Walton
KLB obs 26 Aug 74

Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.
Stony Clove, vic of Hunter, Town of Hunter
S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.
Haines Falls, Town of Hunter
F. W. Kobbé 22 Aug 25--NY
3 mi e of West Kill, Town of Lexington
KLB obs 13 Jun 74
Vic of Beaches Corners, Town of Jewett
KLB obs 4 Jul 75
2 mi n of Windham, Town of Windham
KLB obs 21 Jul 75

Schoharie County

Vic of W. Conesville, Town of Conesville
KLB obs 8 Jun 76

Sullivan County

1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74
Vic of Grahamsville, Town of Neversink
KLB & Paul Huth obs 19 Aug 76

Ulster County

Shandaken, Town of Shandaken
Jas. D. Lowe 29 Jul 1898--PENN
South Hill Rd, n of Ulster Heights, Town of Warwarsing
KLB & Mary Domville obs 11 Jul 70
Overlook Mt, Town of Woodstock
KLB & Mary Domville obs 12 Jul 70
Friedberg Place, 1 mi sw of Boiceville, Town of Olive
KLB & Claire Friedberg obs 18 Jul 73
Nedwidek Place, 4 mi sw of Winnisook, Town of Denning
KLB obs 25 Jun 75

Thelypteris phegopteris (L.) Slosson
Narrow Beech Fern

Flora of
THE CATSKILLS
New York State



Delaware County

- Vic of Stamford, Town of Stamford
5763 P. Dowell 4 Jul 09--BKL (also reported in Am. Fern Jour. 1: 12-13, 1910.)
Andes, Town of Andes
A. M. Taylor in Am. Fern Jour. 14: 87, 1924.
Delhi, Town of Delhi
N. Hotchkiss obs 10 May 27
Gould School, Town of Hancock
3509 E. Whitney 12 Jun 33--NYS
Wilson Hollow, vic of Colchester, Town of Walton
4533 E. Whitney 27 Jul 35--NYS
Youngs, Town of Sidney
5073 E. Whitney 19 Jun 36--NYS
Bullet Hollow Rd, 4 1/2 mi nw of Andes, Town of Delhi
1943 Brooks 17 Aug 52--Brooks, NYS
Watauga Falls, 2 mi n by e of Delhi, Town of Delhi
3095 Brooks 11 Jul 54--NYS

Thelypteris phegopteris

Farmers Hill, 3 mi e by s of Andes, Town of Andes
3736 Brooks 18 Jun 55--NYS
Rosa Farm, 1 mi s of Margaretville, Town of Middletown
4718 Brooks 13 Aug 66--NYS
Vic of Downsville, Town of Colchester
KLB obs 30 May 74

Greene County

Catskill Mt House, Otis Summit, Town of Hunter
Mrs. Chas. Beach [n.d.]--St. Lawrence
Clove Ravine, vic of Haines Falls, Town of Hunter
I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.
Lanesville, Town of Hunter
G. VanIngen Jul 1885--Rochester Acad.
Onteora, Town of Hunter
Anna M. Vail, reported by J. K. Small in Torr. Club Bul. 20: 462,
1893.
Kaaterskill Falls, Town of Hunter
R. Ring: 5 Sep 1899--Buffalo
Stony Clove, vic of Hunter, Town of Hunter
S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.
Haines Falls, Town of Hunter
F. W. Kobbé in Am. Fern Jour. 16: 29-31, 1926; E. R. Lippincott Jul
31--NY
Deep Notch, vic of West Kill, Town of Lexington
SJS obs 15 Jun 56

Sullivan County

Vic of Claryville, Town of Neversink
S. P. Van Gieson 1879--NYS
Vic of Liberty, Town of Liberty
4628 E. Whitney 30 Jul 35--NYS
Between Jeffersonville & N. Branch, Town of Callicoon
SJS obs 20-22 Jun 56
E side of Long Eddy, Town of Fremont
SJS obs 7 Sep 56
1 mi sw of Lew Beach, Town of Rockland
KLB obs 3 Jun 74

Ulster County

Turnwood, Town of Hardenburgh
H. H. Rusby 11 Aug 1891--NY
Bushnellsville, Town of Shandaken
M. F. Miller 3 Aug 1898--PENN
Shandaken, Town of Shandaken
197 M. F. Miller 14 Jul 03--NYS
Phoenicia, Town of Shandaken
4628 E. Whitney 30 Jul 35--NYS

Thelypteris phegopteris

Vic of Woodland [Valley], 4 mi e of Phoenicia, Town of Shandaken

6811 S. J. Smith & Boscom 16 Jun 50--NYS

South Hill Rd, n of Ulster Heights, Town of Warwarsing

KLB & Mary Domville obs 11 Jul 70

Overlook Mt, Town of Woodstock

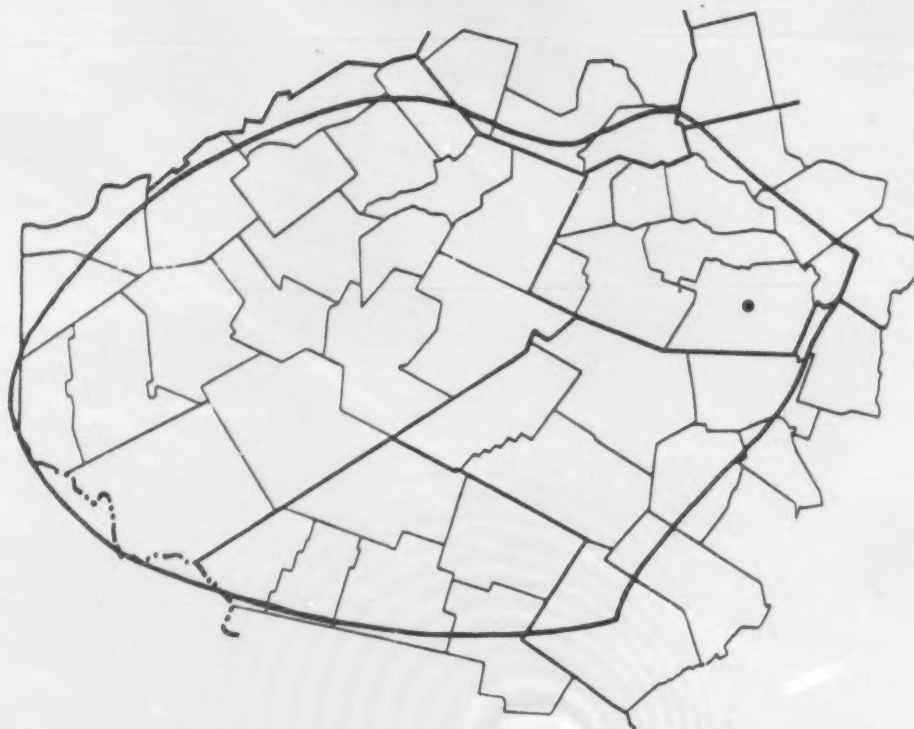
KLB & Mary Domville obs 12 Jul 70

Peekamoose, Town of Denning

1045 M. Domville 12 Jul 71--Domville

Woodsia glabella R. Br.
Smooth Woodsia

Flora of
THE CATSKILLS
New York State



Greene County

Vic of Haines Falls, Town of Hunter

B. D. Gilbert citing Peck in Fern Bul. 11: 97-105, 1903; F. W. Kobbé
1925--NYS (also reported in Am. Fern Jour. 16: 29, 1926); G. R. Proctor
in Rhodora 49: 53-54, 1947 (specimen deposited in Phil.); SJS obs 7
Sep 57 & 21 Jul 62

Woodsia ilvensis (L.) R. Br.
Rusty Woodsia

Flora of
THE CATSKILLS
New York State



Greene County

Clove Ravine, vic of Haines Falls, Town of Hunter

I. H. Hall in Bul. Torr. Bot. Club 5: 38-39, 1874.

Plattekill Cove, Town of Hunter

Anna M. Vail at 1800 ft--NY (also reported by J. K. Small in Torr.
Club Bul. 20: 465, 1893.)

Stony Clove, vic of Hunter, Town of Hunter

S. H. Burnham in Am. Fern Jour. 4: 1-5, 1914.

Windham High Peak, Town of Windham

H. K. Svenson obs 25 Aug 31 in Torreya 31: 154-157, 1931.

Kaaterskill Gorge, Town of Hunter

11287 S. J. Smith & Cooley 28 May 52--NYS

Ulster County

Headwaters of Rondout Creek, Town of Denning

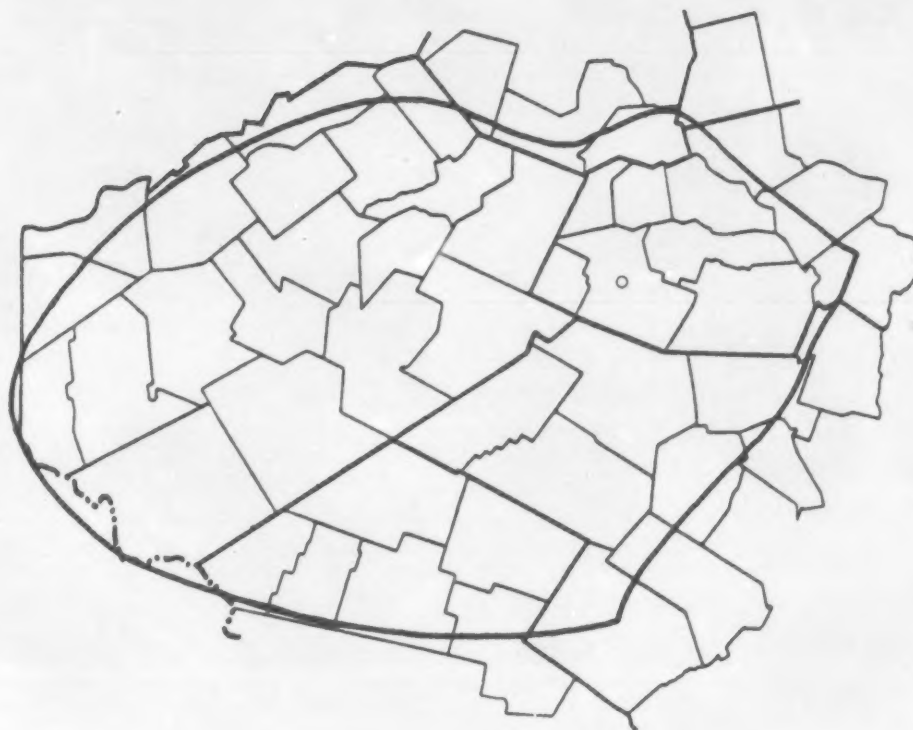
26113 S. J. Smith et al. 5 Sep 58--NYS

Overlook Mt, Town of Woodstock

KLB & Mary Domville obs 12 Jul 70

Woodsia obtusa (Spreng.) Torr.
Blunt-lobed Woodsia

Flora of
THE CATSKILLS
New York State



Greene County

Deep Notch, vic of West Kill, Town of Lexington

S. H. Burnham quoting N. Y. State Mus Rept. 26: 89, 1874 in Am. Fern
Jour. 4: 1-5, 1914.

ADDENDA

After camera copy for this volume had been prepared, several records turned up concerning the elevation at which several species had either been collected or observed. While not of major concern, perhaps, they seemed of sufficient interest to the writer to be included:

Lycopodium annotinum ssp. *annotinum*
Collected at 3800 feet in Greene County.

L. clavatum
Observed above 3000 feet in Greene County.

L. complanatum ssp. *flabelliforme*
Observed above 3000 feet in Greene County.

L. inundatum
Collected at 2000 feet in Ulster County.

L. obscurum
Collected at 4100 feet in Ulster County

Botrychium matricariaefolium
Collected at 2500 feet in Greene County

B. multifidum ssp. *multifidum*
Collected at 2000 feet in Greene County.

Osmunda regalis var. *spectabilis*
Collected at 2000 feet in Greene County.

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